

SINTEF A9721

# REPORT



## *Environmentally friendly pavements: Results from noise measurements 2005-2008.*

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**SINTEF ICT**

Acoustics

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# SINTEF REPORT

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**Environmentally friendly pavements:  
Results from noise measurements 2005-2008.**

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### ABSTRACT

CPX-measurements (tyre A) have been performed on a wide range of ordinary dense Norwegian road pavements and special test pavements, as part of the R&D project "Environmentally friendly pavements" initiated by the Norwegian Public Roads Administration.

The following conclusions can be made from the investigation:

- New dense asphalt concrete pavements can give a tyre/road noise level (CPX) of 4-8 dB(A) lower noise level, compared to a chosen reference level for a pavement of type SMA 0/11. However, after the first winter season with exposure to studded tyres, the noise levels seems to increase with approximately 3-4 dB(A).
- Dense asphalt concrete pavements with a smaller maximum chipping size (6-8 mm) give a higher initial noise reduction, but is more sensible to winter condition and traffic exposure, than pavements with 11-16 mm.
- Thin layers tested in the project seem to behave in the same manner as dense asphalt concrete pavements.
- Porous pavements tested in the project gives an initial noise reduction of 5-9 dB(A), compared to the reference level. Mainly due to wear and winter conditions, the noise reduction is only in the order of 1-2 dB(A) after 2-3 years of traffic.
- Further research and development are needed to achieve low noise pavements that can give a reasonable noise reduction (> 3 dB) over a "normal" lifetime of 6-7 years in a Nordic climate.

KEYWORDS	ENGLISH	NORWEGIAN
GROUP 1	Acoustics	Akustikk
GROUP 2	Noise	Støy
SELECTED BY AUTHOR	Pavements	Veidekker
	CPX-measurements	CPX-målinger

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**Foreword**

This project has been jointly financed by the Norwegian Public Roads Administration through the project “Environmentally friendly pavements” and the Norwegian Research Council through the project “Environmental Noise Phase III”. The contact person at the Norwegian Public Roads Administration has been Jostein Aksnes, who is the main project leader. Project leader at SINTEF has been research scientist Truls Berge. Senior engineer Asbjørn Ustad and engineer Frode Haukland have been assisting the CPX-measurements, together with Odd D. Hansen from the Norwegian Public Roads Administration.

Siv.ing. Stian Ruud Vaktal was temporarily engaged by SINTEF to perform SPB-measurements as part of this project.

## Summary

A total of 37 test pavements have been measured with the CPX-trailer of the Norwegian Public Roads Administration as part of the R&D project “Environmentally friendly pavements”. The measurements have been conducted in the period 2005-2008. The pavements includes normal dense pavements with maximum chipping size varying from 6 to 16 mm, some thin layers and some porous pavements (both single and double layers).

The main CPX-measurements reported here are with the reference tyre A, Avon ZV1. Additional measurements with the new reference tyres (according to a proposal by ISO TC43/SC1 WG33), the SRTT tyre and Avon AV4 have also been included for some of the pavements.

If the speed limit permitted, measurements have been performed at both 50 and 80 km/h.

At a selection of the pavements, measurements according to the statistical pass-by method (SPB) have been performed.

A wide range of measurements of typical Norwegian dense road pavements of stone mastic asphalt (SMA) and dense asphalt concrete (AC) have been performed. A reference values for tyre A at 50 km/h (93 dB(A)) and 80 km/h (100 dB(A)) have been established. The reference values are based on results on the SMA-pavements with maximum chipping size of 11 mm, more than 1 year old.

The main results show that a newly laid dense road pavement can be **4-8 dB(A)** more silent than the reference value, before the pavement is exposed to winter conditions and studded tyres. After the first winter season, the increase in noise levels is approximately **3-4 dB(A)**. Pavements with a maximum chipping size of 6 mm seem to have a higher increase in noise levels due to traffic exposure, than those with 11 or 16 mm maximum chipping size.

Over the 4 year period of the project, the noise increase is about 1 dB(A)/year for dense pavements after the initial loss of 3-4 dB(A).

The thin layers tested in the project seem to behave in a similar way as the dense pavements.

The porous pavements tested in the project seem to give an average noise reduction in the range of **5-9 dB(A)** initially, compared to the reference levels. However, the increase in noise levels due to traffic exposure (winter conditions) seems higher than for dense; an average of approximately 1.5 dB(A) per year. The porous pavements seem to differ somewhat from the dense pavements, in a way that the increase in noise levels is more predominant after the second winter season than after the first. The clogging effect is probably the most important reason for this. Even for the “best” of the porous pavements, the noise reducing effect is less than 2 dB(A) after 2-3 years of lifetime, compared to the reference levels.

The noise reducing effects seem to be in the same range at both 50 and 80 km/h.

## 1 Introduction

Within the research and development project “Environmentally friendly pavements”, by the Norwegian Public Roads Administration, SINTEF has been engaged to perform noise measurements on a wide range of test pavements in the period 2005-2008. In addition to the test pavements within the project itself, measurements have been done at a selection of widely used Norwegian road pavement types. The latter was done in order to have a good foundation to establish possible reference noise values of such road pavements, based on the measuring method used. This report presents all the main results from the measurements. All detailed results from each pavement (separate lanes, speed, noise vs. distance, frequency spectra etc.) are presented in appendix 2.

In addition to noise measurements, texture measurements have also been performed. A detailed analysis of the relationship between texture and noise is presented in a separate SINTEF report [1].

## 2 Measurement methods

### 2.1 CPX-method

The CPX (Close ProXimity) method used in the project is based on the ISO-standard ISO/WD 11819-2, 2008 [2], which is not yet finally approved as an international standard by ISO.

The method is based on the use of microphones located close to one or two sets of reference tyres mounted on either a vehicle or a trailer.

For the purpose of this project, the Norwegian Public Roads Administration invested in 2005 in a CPX-trailer, built by M+P in the Netherlands. Figure 1 shows a picture of this trailer.



*Figure 1 The CPX-trailer*

During the whole period of the project, measurements have been performed with the use of the reference tyre A, Avon ZV1, see figure 2. This tyre was originally chosen to be representative of tyre/road-noise of passenger cars/light vehicles.



**Figure 2** Avon ZV1, 185/65 R15

The previous Committee Draft (CD/2000) of the CPX-method also specifies a reference tyre D, Dunlop SP Arctic, to be representative for the tyre/road noise of heavy vehicles. However, this tyre is no longer commercially available and thus not available for this measurement program. During the period of the project, the ISO Working Group (WG33) developing the CPX-standard, has decided on both a replacement tyre for the A-tyre (since the Avon ZV1 is no longer available) and the D-tyre.

The two new reference tyres are:

**Representing light vehicles (P1):** Uniroyal Tigerpaw, 225/60 R16 (ASTM Standard Reference Test Tyre, SRTT)

**Representing heavy vehicles (H1):** Avon Supervan AV4, 195/80 R14.



**Figure 3** Uniroyal Tigerpaw, SRTT

Avon AV4

During the last part of the project parallel measurements with these two new reference tyres have been performed together with the “old” tyre A for comparison reasons. The main results presented in this report is however, for the Avon ZV1-tyres (tyre A), in order to have constant and comparable results with texture measurements performed at the same locations. Comparisons between measured levels of the old and new reference tyres for light vehicles are presented in chapter 7.

The CPX-method requires measurements of the average A-weighted sound level over a chosen length of the test section ( $> 100$  m) at two reference speeds 50 and 80 km/h. The overall level for the test section is the average of segments of 20 m. In addition to the average sound level, the  $1/3^{\text{rd}}$  octave band frequency levels from 315 Hz to 5 kHz are measured.

With the Norwegian CPX-trailer, with two tyres mounted on the trailer, it is possible for parallel measurements in the left and right wheel track.

## 2.2 SPB-method

The SPB (“Statistical Pass-By”)-method is standardised by ISO (ISO 11819-1 [3]) and is currently under revision. The method describes measurements of the sound levels from passing vehicles at a distance of 7.5 m from the centre of the lane. The vehicles are divided into 3 classes: light vehicles, heavy vehicles with 2 axles and heavy vehicles with 3 axles or more.

In addition to the sound levels, the speed of the vehicles is also measured. An index based on chosen weighting factors for the traffic composition at the location can be calculated for a reference speed of 50, 80 or 110 km/h.

## 3 Test pavements

A total of 37 test pavements have been constructed during the project period. Table 1 shows an overview of all the pavements, with the main descriptors, including the year of production. More detailed information about the pavements can be found in [4].

*Table 1 Overview of test pavements*

Nr	Road	Location	Year	Surface layer	Type
1	Rv715	Trolla, Trondheim	2005	AC6*	Dense
2				AC8	
3				AC11	
4				SMA6**	
5				SMA8	
6				SMA11	
7	E6	Melhus	2005	SMA11, 1% rubber	Dense
8				SMA11, 3% rubber	
9	E18	Oslo	2005	SMA6	Dense
10				SMA8	
11				SMA11	
12				SMA16	
13	E16	Hønefoss	2005	AC6	Dense
14				AC8	
15				AC11	
16	E6	Stange	2005	AC6	Dense
17				T8g, rubber +pmb	Dense
18				Wa8, pmb	Porous
19				Da11, pmb	Porous
20	Rv2	Kongsvinger	2006	ViaQ8, pmb	Thin layers
21				T8s	
22	Rv161	Oslo	2006	Novachip8, pmb	Thin layers
23				T8s, pmb	
24	Rv170	Bjørkelangen	2006	Da11, pmb	Porous, single layer
25				Wa8/Da16, pmb	Porous, twin layer
26				ViaQ11/ViaQ16, pmb	Porous, twin layer
27				DaFib8/DaFib16, pmb	Porous, twin layer
28	E6	Stjørdal	2007	SMA8, pmb	Dense
29				SMA11, pmb	
30	E6	Trondheim	2007	SMA8, pmb	Dense
31				SMA11, pmb	
32	Rv20	Elverum	2007	T8s, pmb	Thin layer
33	Rv62	Eidsvåg	2007	AC6, pmb	Dense
34	Rv118	Moss, Rygge	2007	ViaStab8, pmb	Dense
35	Rv582	Bergen	2007	Sealastic8, pmb	Dense, special layer
36	E6	Horg	2008	Da11/Da16, pmb	Porous, twin layer
37	Rv25	Hamar	2008	Da11/Da16, pmb	Porous, twin layer

\*AC= Asphalt Concrete

\*\*SMA= Stone Mastic Asphalt



#### 4 Other dense pavements

In addition to these test pavements, a wide range of ordinary dense asphalt concrete pavements have been measured during the project period. Partly to measure existing pavements next to the test pavement and partly to establish typical CPX-levels for widely used pavement types in Norway.

Table 2 shows an overview of all these pavements (all dense). In appendix 1, the measured levels at 50 and 80 km/h (if possible) are listed.

*Table 2 Dense pavements*

No	County	Year	Road	Location	Surface layer
38	Hedmark	2003	Rv2	Kongsvinger	SMA11
39		1999			SMA14
40		2003			AC6
41		2003			AC6
42		2003			SMA8
43	Hedmark	2003	Rv2	Kongsvinger,	SMA8
44		2003		Rasta	SMA11
45		2003			SMA11
46		1996			SMA14
47	Hedmark	2000	Rv2	Skarnes	AC8
48	Hedmark	1999	E6	Stange	SMA14
49		1999		Østfold border	SMA16
50	Akershus	2004	E6	Son	SMA11
51		2000		Kvestad	SMA16
52		2003		Vinterbro	SMA11
53		1991		Egne Hjem	SMA16
54	Akershus	1994	Rv160	Bjørnemyra	SMA16
55		2000		Levre	SMA16
56	Akershus	1994	Rv168	Nordli	SMA16
57		2004		Kolsås	SMA11
58		2004		Østfold border	AC11
59	Akershus	2004	Rv120	Bjerke	AC11
60		2002		Tømmerbråten	SMA8
61		2001		Rælingen	SMA11
62	Akershus	2006	Rv170	Bjørkelangen	SMA11
63	Buskerud	2002	E16	Hønefoss	AC11
64		2003		Korporals bru	AC16
65		1998		Støren	SMA16
66		2004		Horg	SMA11
67		2008		Horg	SMA11
68	Sør-Trøndelag	1999	E6	Omkj.veien	SMA16 Lane 4
69		2001		Omkj.veien	SMA16 Lane 3
70		2005		Omkj.veien	SMA11 Lane 3
71		2006		Omkj.veien	SMA11 Lane 4
72		2008		Omkj.veien	SMA11 Lane 1
73		1999		Omkj.veien	SMA16 Lane 3
74		2007		Omkj.veien	SMA11 Lane 2
75		2005		Klett	SMA11
76	Sør-Trøndelag	2005	Rv715	Trolla	SMA11
77		2001		Trolla	AC16
78	Sør-Trøndelag	1999	Rv704	Klæbu	AC16
79		2005		Klett/Udduvoll	AC11
80	Sør-Trøndelag	2008	E39	Øysand	SMA11
81		2005		Viggja	AC11
82	Nord-Trøndelag	2003	E6	Stjørdal	SMA16
83	Møre- og Romsdal	1992	Rv62	Eidsvåg	AC16
84	Hedmark	1998	Rv25	Hamar	SMA11

## 5 Data processing methods

At each test section, the noise levels have been measured twice at the same speed. The following pavements have only been measured in one single lane (mostly because the test pavements were laid in one lane only: Pavements 1-6, 7-8, 9-12, 22-23 and 30-31. For these pavements, the final result is based on the average of the two runs. For the rest of the pavements, the noise was measured in both lanes and the final result is based on the arithmetic average of the two lanes and the arithmetic average of the two runs.

The test pavement at Rv20, Elverum (pavement 32) is about 2.6 km long and too long for continuous measurements with the CPX-equipment. At this location, measurements were done at 3 sections; one at each start and end, and one in the middle of the test pavement. Each of the sections was approximately 300-500 m long. The average of all the 3 sections constitutes the final level.

Measurements have been performed with the same type of tyre on both sides of the trailer, and the final result is then the average of left and right tyre. In appendix 2, with all the detailed results, the level for each wheel track is presented separately.

As part of the testing of new sets of reference tyres for the CPX-method, some of the measurements in 2008 have been performed with the Avon ZV1 tyre (Tyre A) on the right side of the trailer and the Uniroyal Tigerpaw (SRTT) tyre on the left side.

All results have been temperature corrected ( $t_{air}$ ) to + 20 °C, using the following relationships:

Dense surface layers: -0.06 dB/°C

Porous surface layers: -0.03 dB/°C

The correction factors show that at a *low* temperature the noise level *increase*.

## 6 Measurement results

### 6.1 Reference levels

It has been decided to use measurement results from all pavements of the type SMA11 (chipping size 0/11) older than one year (in practice exposed to minimum one winter season) as a foundation for establishing a reference value for CPX-levels of Tyre A at 50 and 80 km/h.

In table 3 the results for the average levels at 50 and 80 km/h for all measured pavements on SMA11 are summarized.

*Table 3 Average levels for reference values based on SMA11.*

Speed, km/h	Number of measurements	Average level, dB(A)	Standard deviation, dB(A)	90% Confidence interval, dB(A)
50	44	92.9	0.7	1.2
80	34	100.0	1.0	1.6

Based on these results, the following reference levels have been chosen to be representative CPX-levels based measurements with tyre A, Avon ZV1 (light vehicles only):

**50 km/h: 93.0 dB(A)**

**80 km/h: 100.0 dB(A)**

These levels are used to compare the measured levels on the test pavements with a “reference value”, to evaluate the potential noise reduction related to tyre/road noise from passenger cars/light vehicles.

## 6.2 Test pavements

The results are presented in groups of pavement types; dense, thin layers and porous, and related to chipping sizes. For each year, the average measured level,  $L_A$ , dB(A), are presented and the change of levels over the measured period.

### 6.2.1 Dense pavements

It should be noted that the test pavements 13-15 were not measured in 2008. It seems that the levels had stabilised after 2 winter seasons, and thus excluded from the test program in 2008.

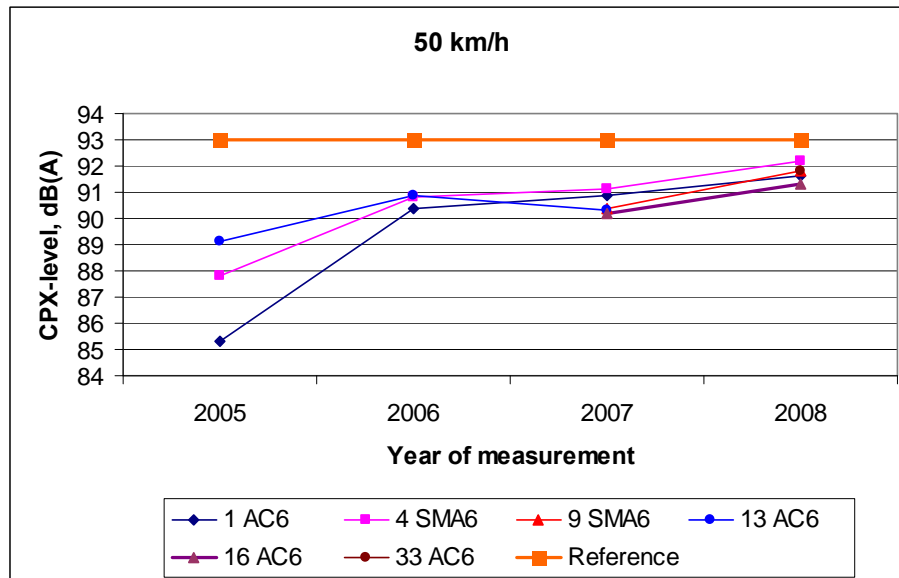
#### 6.2.1.1 Chipping size 0/6 mm

The results for pavements with maximum chipping sizes of 6 mm are given in tables 4-5 and figures 4-5 for each year of measurements. In the figures, the levels are compared with the reference values given in 6.1. The change of levels is from the first year of measurements to 2008 (except for pavement 13). Standard deviation for the average noise level of each of the wheel tracks are given in the appendix 2. On pavements 1, 4 and 33, the posted speed is < 80 km/h, and only measurements at 50 km/h have been possible. Not all pavements have been measured at 50 km/h, due to general traffic and weather conditions during the measurements.

**Table 4** Chipping size 0/6 mm. CPX-levels,  $L_A$ , dB(A), 50 km/h

Pavem. no.	Surface layer	Year of prod.	2005 $L_A$ , dB(A)	2006 $L_A$ , dB(A)	2007 $L_A$ , dB(A)	2008 $L_A$ , dB(A)	Change dB(A)
1	AC6	2005	85.3	90.4	90.9	91.6	+ 6.3
4	SMA6	2005	87.8	90.8	91.1	92.2	+ 4.4
9	SMA6	2005	-	-	90.4	91.8	+ 1.4
13	AC6	2005	89.1	90.9	90.3	-	+ 1.2
16	AC6*	2005	-	-	90.2	91.3	+ 1.1
33	AC6	2007	-	-	-	91.8	-

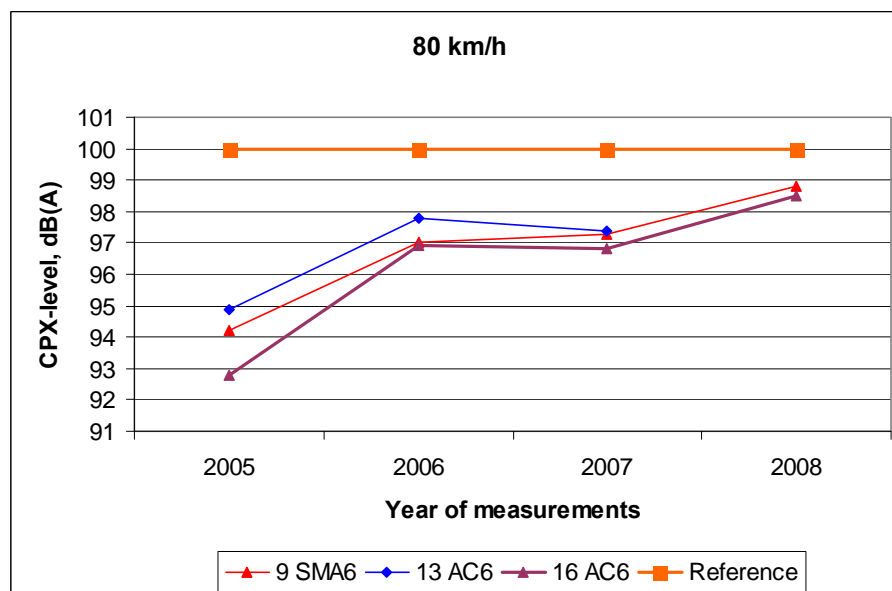
\* Due to deviations from the receipt, the actual pavement is to be considered as an AC4-pavement



**Figure 4** Chipping size 0/6 mm. CPX-levels at 50 km/h

**Table 5** Chipping size 0/6 mm. CPX-levels,  $L_A$ , dB(A), 80 km/h

Pavem. no.	Surface layer	Year of prod.	2005 $L_A$ , dB(A)	2006 $L_A$ , dB(A)	2007 $L_A$ , dB(A)	2008 $L_A$ , dB(A)	Change dB(A)
9	SMA6	2005	94.2	97.0	97.3	98.8	+ 4.6
13	AC6	2005	94.9	97.8	97.4	-	+ 2.5
16	AC6	2005	92.8	96.9	96.8	98.5	+ 5.7



**Figure 5** Chipping size 0/6 mm. CPX-levels at 80 km/h

For pavements with measured levels from the same year as being produced, and not exposed to any winter conditions, the change in noise levels after 3 years is in the range of 4-6 dB(A). The changes are always largest after the first winter season, 3-4 dB(A).

An exception of this is pavement 13, which seems to have a smaller change (1-3 dB(A)) over the measured period.

On average, the test pavements with a chipping size of 0/6 mm seem to increase the levels with approximately 1.1 dB(A)/year, both at 50 and 80 km/h

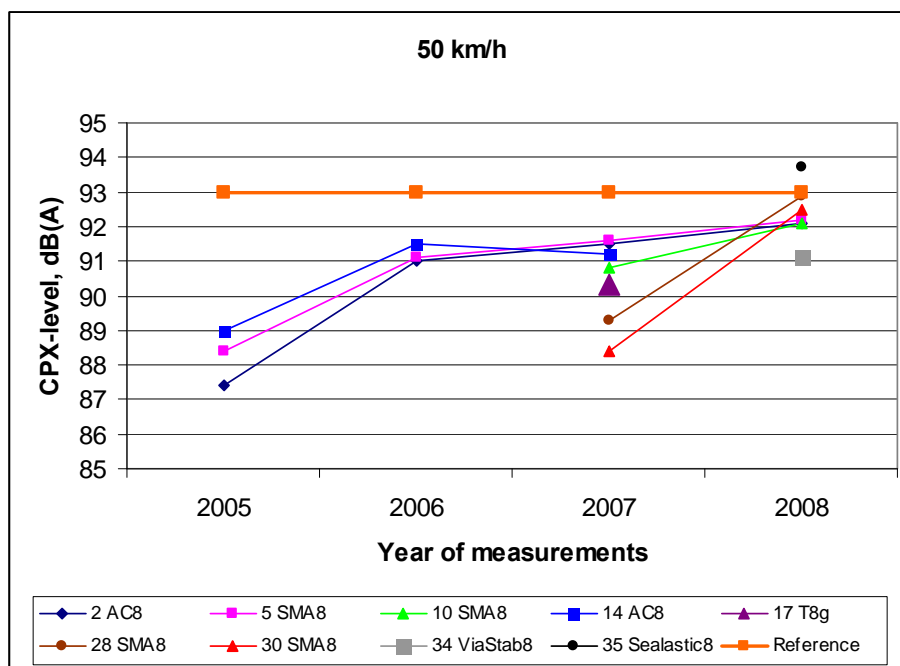
### 6.2.1.2 Chipping size 0/8 mm

The results are given in tables 6, 7 and in figures 6, 7. On pavements 2, 5, 34 and 35, the posted speed is < 80 km/h, and only measurements at 50 km/h have been possible.

**Table 6** Chipping size 0/8 mm. CPX-levels,  $L_A$ , dB(A), 50 km/h

Pavem. no.	Surface layer	Year of prod.	2005 $L_A$ , dB(A)	2006 $L_A$ , dB(A)	2007 $L_A$ , dB(A)	2008 $L_A$ , dB(A)	Change dB(A)
2	AC8	2005	87.4	91.0	91.5	92.1	+ 4.7
5	SMA8	2005	88.4	91.1	91.6	92.2	+ 3.8
10	SMA8	2005	-	-	90.8	92.1	+ 1.3
14	AC8	2005	89.0	91.5	91.2	-	+ 2.2
17	T8g	2005	-	-	90.3	-	-
28	SMA8	2007	-	-	89.3	92.9	+ 3.6
30	SMA8	2007	-	-	88.4	92.5	+ 4.1
34	ViaStab8*	2007	-	-	-	91.1	-
35	Sealastic8*	2007	-	-	-	93.7	-

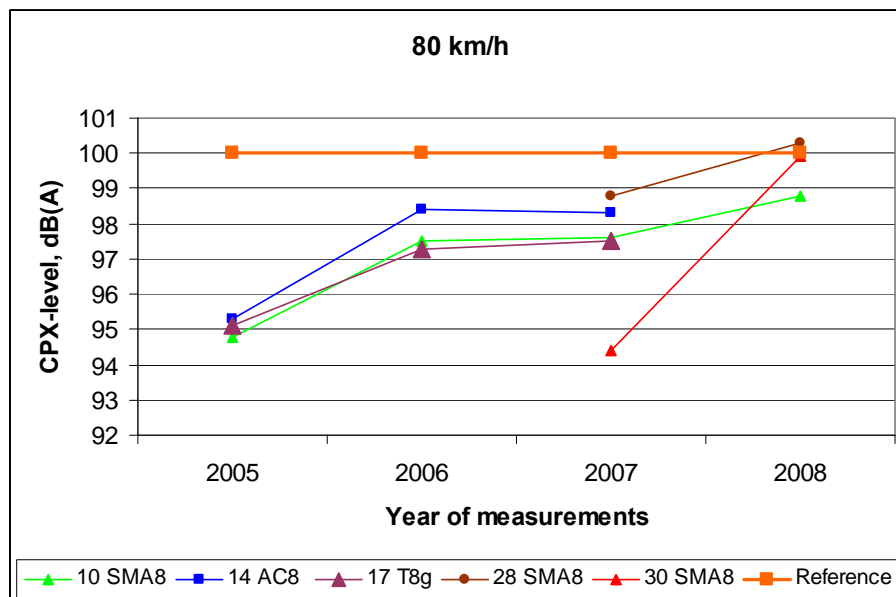
\*Special dense layers



**Figure 6** Chipping size 0/8 mm. CPX-levels at 50 km/h

**Table 7** Chipping size 0/8 mm. CPX-levels,  $L_A$ , dB(A), 80 km/h

Pavem. no.	Surface Layer	Year of prod.	2005 $L_A$ , dB(A)	2006 $L_A$ , dB(A)	2007 $L_A$ , dB(A)	2008 $L_A$ , dB(A)	Change dB(A)
10	SMA8	2005	94.8	97.5	97.6	98.8	+ 4.0
14	AC8	2005	95.3	98.4	98.3	-	+ 3.0
17	T8g	2005	95.1	97.3	97.5	-	+ 2.4
28	SMA8	2007	-	-	98.8	100.3	+ 1.5
30	SMA8	2007	-	-	94.4	99.9	+ 5.5



**Figure 7** Chipping size 0/8 mm. CPX-levels at 80 km/h

On average, the test pavements with a chipping size of 0/8 mm seems to increase the levels with approx. 1 dB(A)/year and 2-4 dB(A) after the first winter season. This is in the same order as for pavements with 0/6 mm.

The change in levels from 2007 to 2008 for pavement 28 seems to be higher at 50 km/h than at 80 km/h. The reason for these speed dependent differences is not obvious.

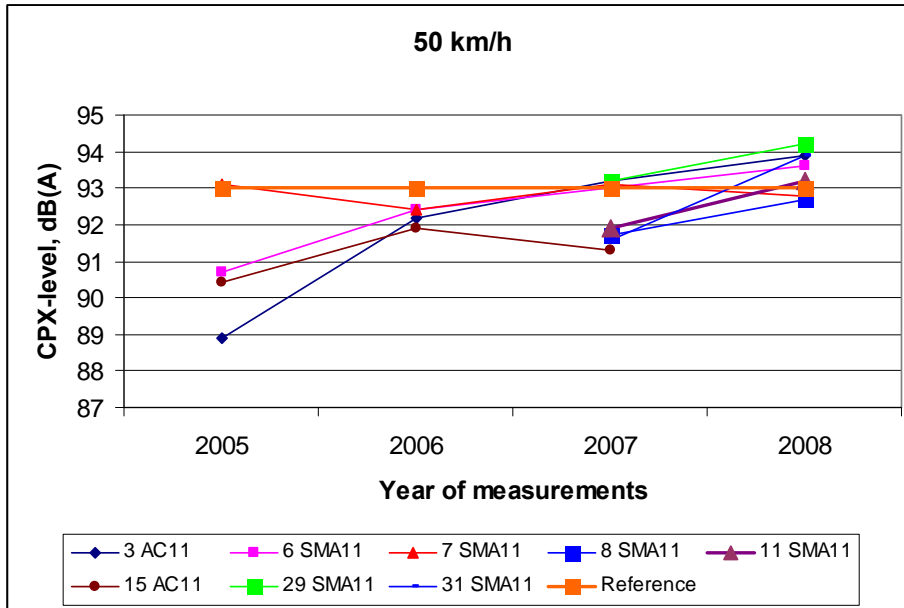
As can be seen from table 6, pavements 10 and 17 have not been measured at 50 km/h, due to the general traffic situation at these locations. Pavements 34 and 35 were constructed late in 2007 and after the measurement program had been finalised that year.

### 6.2.1.3 Chipping size 0/11 mm

The results are given in tables 8, 9 and in figures 8, 9. On pavements 3 and 6 the posted speed is < 80 km/h and they are only measured at 50 km/h.

**Table 8** Chipping size 0/11 mm. CPX-levels,  $L_A$ , dB(A), 50 km/h

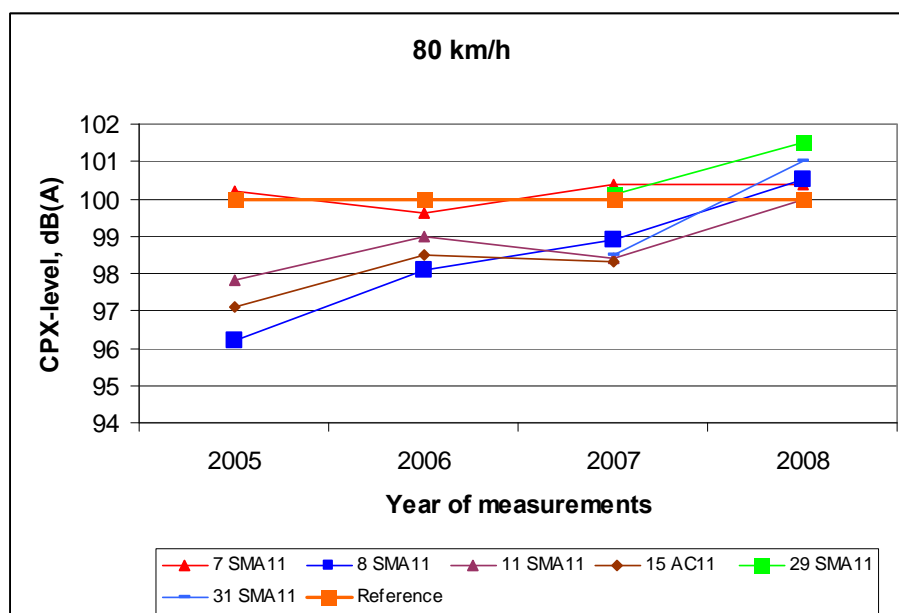
Pavem. no.	Surface layer	Year of prod.	2005 $L_A$ , dB(A)	2006 $L_A$ , dB(A)	2007 $L_A$ , dB(A)	2008 $L_A$ , dB(A)	Change dB(A)
3	AC11	2005	88.9	92.2	93.2	93.9	+ 5.0
6	SMA11	2005	90.7	92.4	93.0	93.6	+ 2.9
7	SMA11	2005	93.1	92.4	93.1	92.8	- 0.3
8	SMA11	2005	-	-	91.7	92.7	+ 1.0
11	SMA11	2005	-	-	91.9	93.2	+ 1.3
15	AC11	2005	90.4	91.9	91.3	-	+ 0.9
29	SMA11	2007	-	-	93.2	94.2	+ 1.0
31	SMA11	2007	-	-	91.6	93.9	+ 2.3



*Figure 8 Chipping size 0/11 mm. CPX-levels at 50 km/h*

*Table 9 Chipping size 0/11 mm. CPX-levels,  $L_A$ , dB(A), 80 km/h*

Pavem. no.	Surface Layer	Year of prod.	2005 $L_A$ , dB(A)	2006 $L_A$ , dB(A)	2007 $L_A$ , dB(A)	2008 $L_A$ , dB(A)	Change dB(A)
7	SMA11	2005	100.2	99.6	100.4	100.4	+ 0.2
8	SMA11	2005	96.2	98.1	98.9	100.5	+ 4.3
11	SMA11	2005	97.8	99.0	98.4	100.0	+ 2.2
15	AC11	2005	97.1	98.5	98.3	-	+ 1.2
29	SMA11	2007	-	-	100.1	101.5	+ 1.4
31	SMA11	2007	-	-	98.5	101.0	+ 2.5



*Figure 9 Chipping size 0/11 mm. CPX-levels at 80 km/h*

From the results, it seems like pavement 7 (SMA11 with 1% rubber granulate added) initially had a rather high level (before the first winter). However, it should be noted that the air temperature was + 3 °C and the road temperature – 3 °C during the measurements in 2005, and on the “edge” of the allowed temperature area. Even if the results have been temperature corrected to + 20 °C, the low temperature may well be the main reason for the high levels.

The average increase in noise levels for these type of pavements is 1.1 dB(A)/year (pavement 7 not included), which is in the same order as for 0/6 and 0/8 mm.

The reference levels are based on measurement results on AC11 and SMA11 pavements more than 1 year old (chapter 6.1). The noise level development for the test pavements as shown in figures 8 and 9 is within the normal variations of the pavements that constitutes the reference. The test pavements with chipping sizes 0/11 mm cannot be considered to be low noise pavements. This is also valid for pavements 7 and 8, where a small percentage of rubber was added to the bitumen.

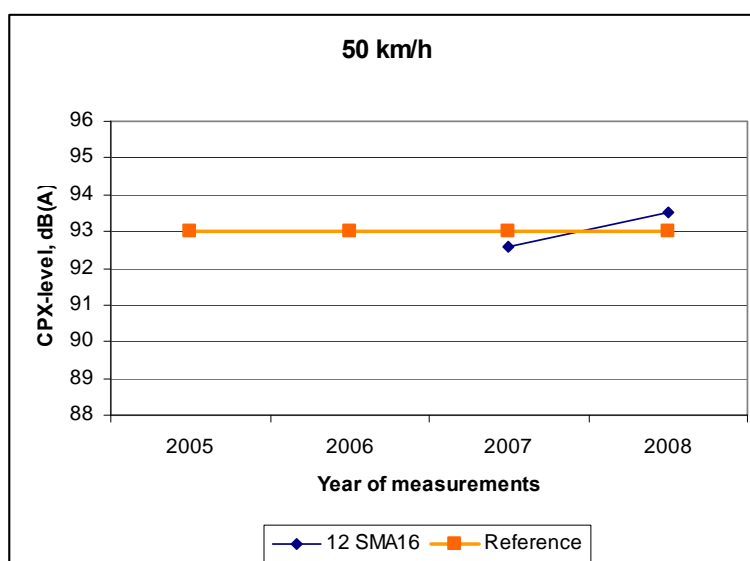
#### 6.2.1.4 Chipping size 0/16 mm

Only one test pavement was laid out with maximum chipping size of 16 mm; pavement 12. The results are given in tables 10, 11 and in figures 10, 11.

A 0/16 mm pavement is not considered to be a low noise pavement, but pavement 12 was constructed at E18 outside Oslo together with pavements 9-11 (along the same lane), to study the effect of SMA-pavements with different chipping sizes. Due to traffic conditions, the pavement was not tested at 50 km/h in 2005 and 2006.

**Table 10** Chipping size 0/16 mm. CPX-levels,  $L_A$ , dB(A), 50 km/h

Pavem. no.	Surface Layer	Year of prod.	2005 $L_A$ , dB(A)	2006 $L_A$ , dB(A)	2007 $L_A$ , dB(A)	2008 $L_A$ , dB(A)	Change dB(A)
12	SMA16	2005	-	-	92.6	93.5	+ 0.9

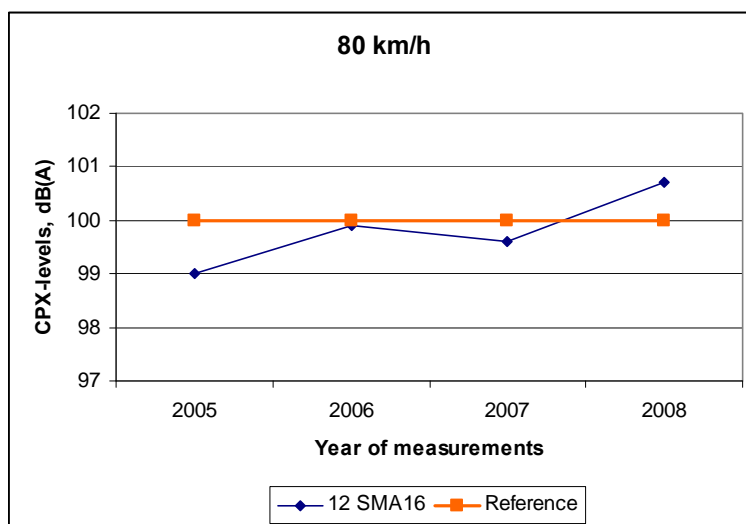


**Figure 10** Chipping size 0/16 mm. CPX-levels at 50 km/h



**Table 11** Chipping size 0/16 mm. CPX-levels,  $L_A$ , dB(A), 80 km/h

Pavement no.	Surface Layer	Year of prod.	2005 $L_A$ , dB(A)	2006 $L_A$ , dB(A)	2007 $L_A$ , dB(A)	2008 $L_A$ , dB(A)	Change dB(A)
12	SMA16	2005	99.0	99.9	99.6	100.7	+ 1.7



**Figure 11** Chipping size 0/16 mm. CPX-levels at 80 km/h

As can be seen from figures 10 and 11, this pavement has a acoustical development as could be expected, with a somewhat higher noise level than 0/11 mm pavements after 3 years of traffic exposure. Due to the larger maximum chipping size, the change in level per year is also lower than for 0/6-0/11 mm, approximately 0.5 dB(A)/year.

### 6.2.2 Thin layers

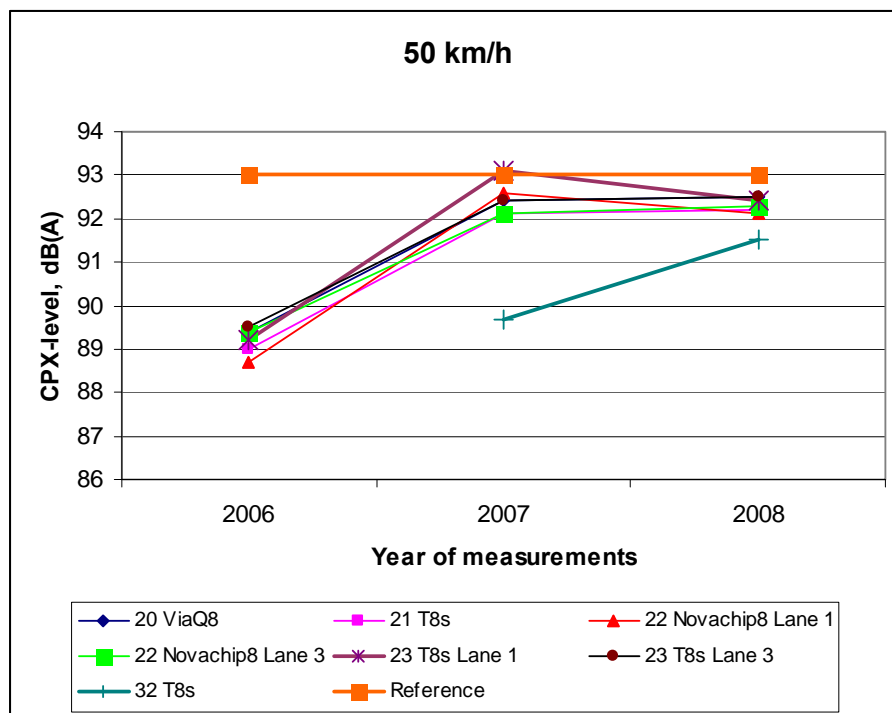
In this project, thin layers are defined as layers laid down in a special process, by using a machine allowing the some of the polymer modified binder emulsion (beside being part of the glue) to merge into the main layer from the bottom.

All the thin layers are located at areas with posted speed < 80 km/h, so only results for a reference speed of 50 km/h are available. The measurements on the thin layers started in 2006.

The thin layers tested in this project have maximum chipping size of 8 mm and the results are given in table 12 and in figure 12. The results for pavements 22 and 23 (Rv161, Oslo) are given separately for each lane. Lane 1 is available for general traffic, while lane 3 is for public transport (including taxis, electric and hybrids) only and thus it has a different traffic load than lane 1.

**Table 12** Thin layers, chipping size 0/8 mm. CPX-levels,  $L_A$ , dB(A), 50 km/h

Pavem. no.	Surface layer	Year of prod.	2006 $L_A$ , dB(A)	2007 $L_A$ , dB(A)	2008 $L_A$ , dB(A)	Change dB(A)
20	ViaQ8	2006	89.4	92.4	92.5	+ 3.1
21	T8s	2006	89.0	92.1	92.2	+ 3.2
22	Novachip8 Lane 1	2006	88.7	92.6	92.1	+ 3.4
22	Novachip8 Lane 3	2006	89.4	92.1	92.3	+ 2.9
23	T8s Lane 1	2006	89.2	93.1	92.4	+ 3.2
23	T8s Lane 3	2006	89.5	92.4	92.5	+ 3.0
32	T8s	2007	-	89.7	91.5	+ 1.8



**Figure 12** Thin layers, chipping size mm. CPX-levels at 50 km/h

The results show that all these pavements seem to behave similarly, with an increase of levels of approximately 1.2 dB(A)/year. As for all the other dense pavements, the increase is largest the first year, on average + 3 dB(A). Pavement 32 seems to have a somewhat different development, with an increase of less than 2 dB(A) after the first winter season. The reason could be that this test pavement is on a location with quite a low traffic volume (7500 ADT).

In general, the thin layers of 0/8 mm seems to behave acoustically in the same manner as the other dense test pavements of 0/8 mm (see figure 6).

### 6.2.3 Porous pavements

A total of 3 single layer and 5 double (twin) layer porous pavements have been tested during the project period. 2 of the double layers were produced during 2008 (pavement 36 and 37) and noise measurements are thus only available for the first year, before any exposure to winter conditions.

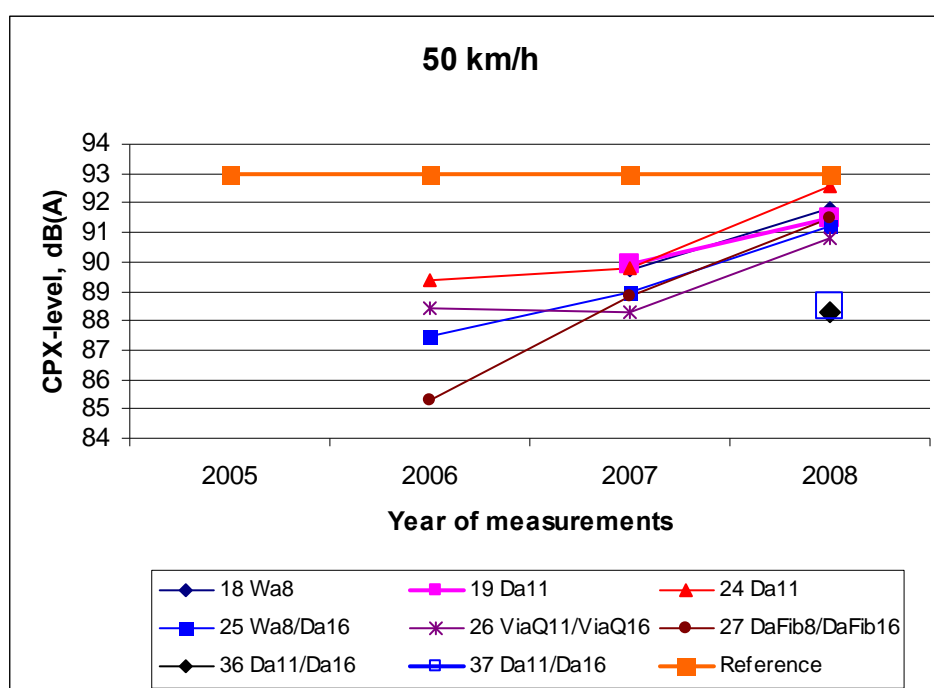
Table 13, 14 and figures 13, 14 shows the results from the CPX-measurements.

On pavements 18 and 19, measurements at 50 km/h have been performed in 2007 and 2008 only.

On pavements 24-27 measurements were made both in June 2007 and Sept. 2007. Only the results from June are reported here. In general, the levels had increased by approximately 1 dB(A) from June until September.

*Table 13 Porous pavements. CPX-levels,  $L_A$ , dB(A), 50 km/h*

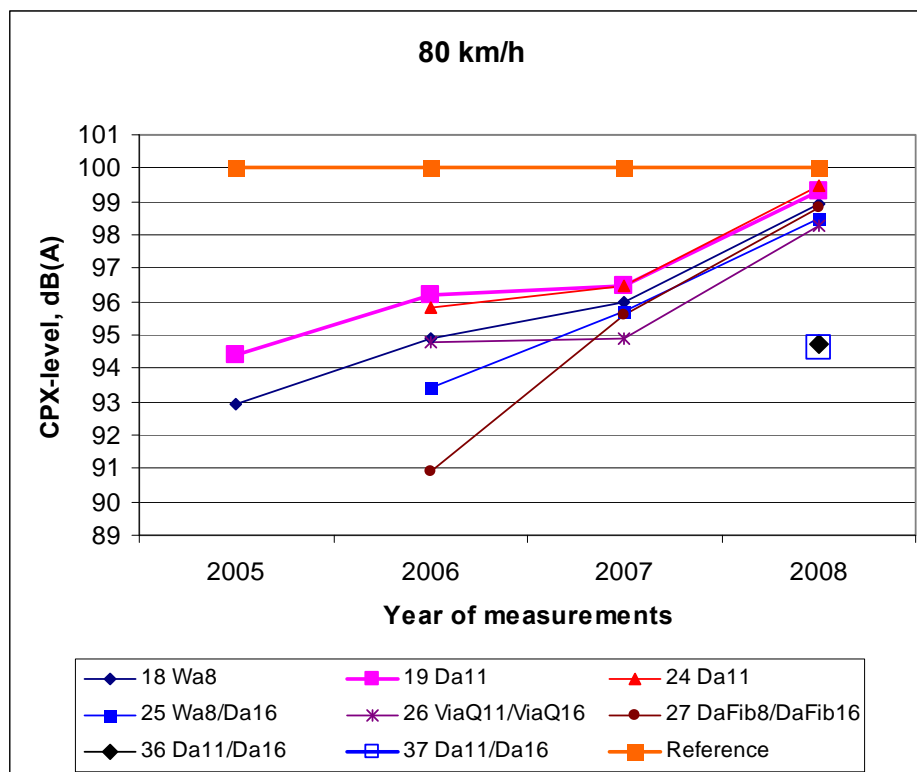
Pavem. no.	Surface layer	Layer type	Year of prod.	2005 $L_A$ dB(A)	2006 $L_A$ dB(A)	2007 $L_A$ dB(A)	2008 $L_A$ dB(A)	Change dB(A)
18	Wa8	Single	2005	-	-	89.7	91.8	+ 2.1
19	Da11	Single	2005	-	-	89.9	91.5	+ 1.6
24	Da11	Single	2006	-	89.4	89.8	92.6	+ 3.2
25	Wa8/Da16	Twin	2006	-	87.5	89.0	91.2	+ 3.7
26	ViaQ11/ViaQ16	Twin	2006	-	88.4	88.3	90.8	+ 2.4
27	DaFib8/DaFib16	Twin	2006	-	85.3	88.7	91.5	+ 6.2
36	Da11/Da16	Twin	2008	-	-	-	88.3	-
37	Da11/Da16	Twin	2008	-	-	-	88.5	-



*Figure 13 Porous pavements, CPX-levels, 50 km/h*

*Table 14 Porous pavements. CPX-levels,  $L_A$ , dB(A), 80 km/h*

Pavem. no.	Surface layer	Layer type	Year of prod.	2005 $L_A$ dB(A)	2006 $L_A$ dB(A)	2007 $L_A$ dB(A)	2008 $L_A$ dB(A)	Change dB(A)
18	Wa8	Single	2005	92.9	94.9	96.0	98.9	+ 6.0
19	Da11	Single	2005	94.4	96.2	96.5	99.3	+ 4.9
24	Da11	Single	2006	-	95.8	96.5	99.5	+ 3.7
25	Wa8/Da16	Twin	2006	-	93.4	95.7	98.5	+ 5.1
26	ViaQ11/ViaQ16	Twin	2006	-	94.8	96.5	98.3	+ 3.5
27	DaFib8/DaFib16	Twin	2006	-	90.9	95.6	98.8	+ 7.9
36	Da11/Da16	Twin	2008	-	-	-	94.7	-
37	Da11/Da16	Twin	2008	-	-	-	94.6	-



*Figure 14 Porous pavements, CPX-levels, 80 km/h*

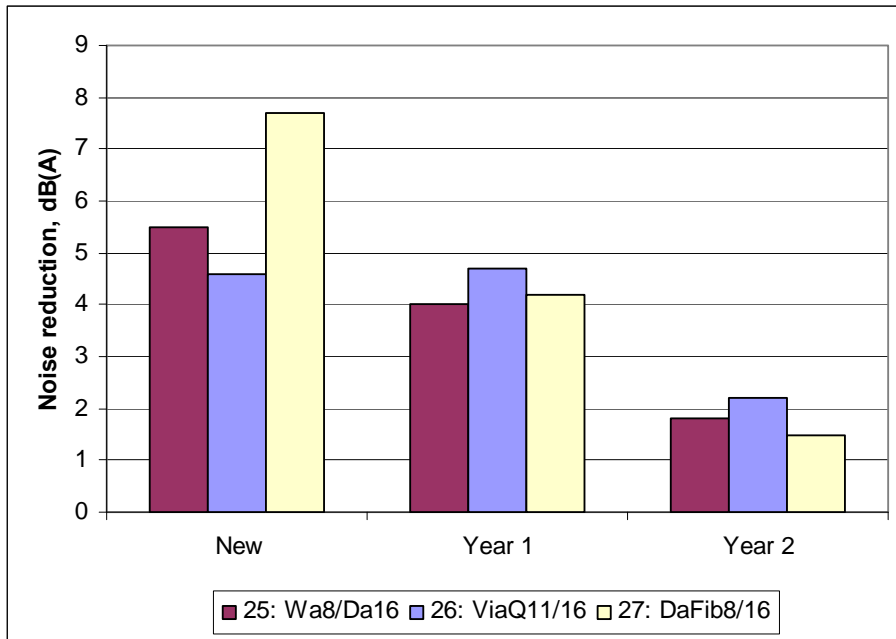
The behaviour of the porous pavements seems to be somewhat different to the dense, as can be seen especially in figure 14. The increase in noise levels seems to be more significant the second or third winter season. This can be related to the clogging effect; the clogging is more severe after two or more years of traffic. On average, the increase in noise is about 1.5 dB(A)/year for the porous pavements.

This increase in noise levels indicates that if a porous road pavement initially is about **6 dB(A)** below a standard “reference” pavement, it will not have any noise reducing ability after a period of about **4 years**. If effective cleaning is applied, this can potentially restore some of the porosity and the acoustic performance.

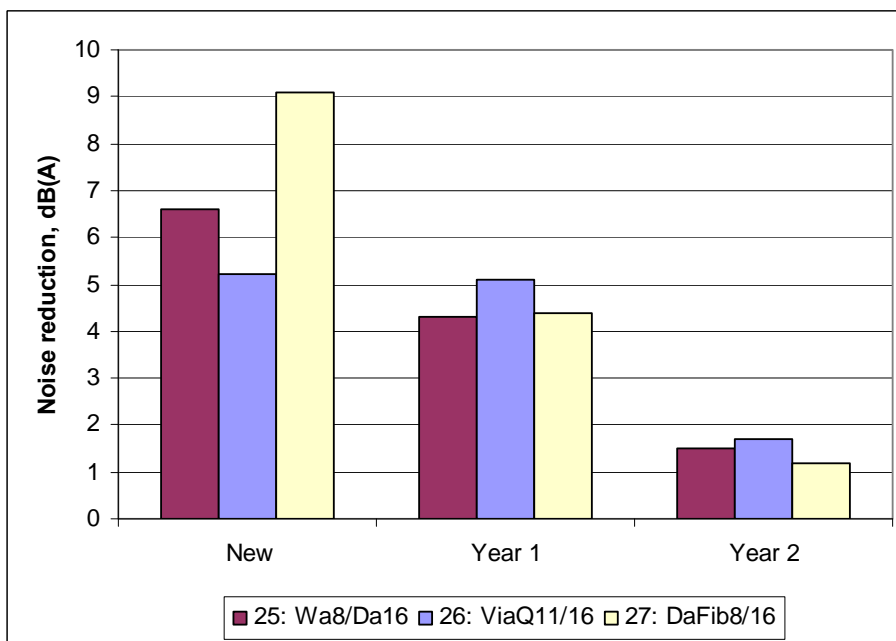
On pavements 24 to 27, a cleaning experiment was carried out in 2007 (before the measurements in June), with no effect on the noise performance [5].

For the double layer porous pavements 25, 26 27, the average noise reduction as a function of year relative to the reference levels, are shown in figures 15 and 16.

The experiences with single and double layer porous pavements in this project do not indicate that the acoustical performance of the single layer is different from the double layers after 2-3 years of lifetime. This is not in line with experiences in other countries, like in the Netherlands, where double layers have a higher noise reduction over expected lifetime, than the single layers.



*Figure 15 Tyre A: average noise reduction, dB(A), 50 km/h*



*Figure 16 Tyre A: average noise reduction, dB(A), 80 km/h*

The figures show that pavement 27 had initially the highest noise reduction, but has the lowest after only two winter seasons. Pavement 26 seems to keep the relative high noise reduction (4-5 dB(A)) after the first winter season, but it is reduced to 1.5-2 dB(A) after the next winter, probably due to clogging.

### 6.3 Other dense pavements

As shown in chapter 4, a wide range of measurements were carried out on typical dense road pavements. The main issue was to establish a reference level, but also to see if there is large variation in levels, due to age, traffic load, use of studded tyres, region etc.

In table 15, the main results from these measurements are shown.

The table shows the year of production and the year of measurements. The numbering of pavements refers to table 2.

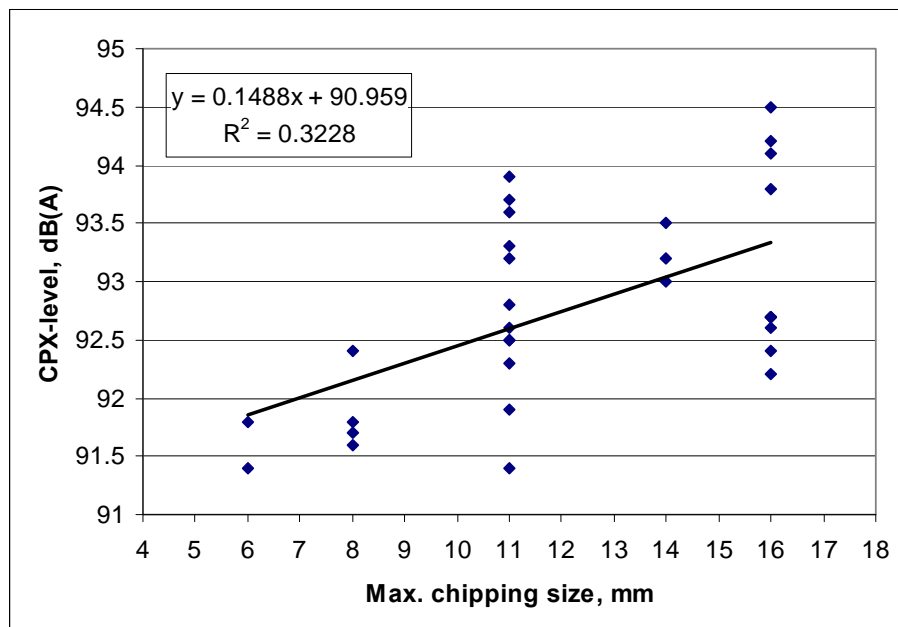
*Table 15 CPX-levels of dense pavements in Norway. Measurements at 50 and 80 km/h*

No	Surface layer	Prod. year	2005		2006		2007		2008	
			50	80	50	80	50	80	50	80
38	SMA11	2003	92.5	99.6	92.6	99.4	-	-	-	-
39	SMA14	1999	93.2	100.3	93.0	100.0	-	-	-	-
40	AC6	2003	91.4	-	-	-	-	-	-	-
41	AC6	2003	91.8	-	-	-	-	-	-	-
42	SMA8	2003	91.7	-	90.7	-	-	-	-	-
43	SMA8	2003	91.8	-	90.9	-	-	-	-	-
44	SMA11	2003	92.8	-	92.5	-	92.7	-	92.4	-
45	SMA11	2003	93.2	-	93.4	-	-	-	-	-
46	SMA14	1996	93.5	100.8	93.5	100.9	-	-	-	-
47	AC8	2000	92.4	100.2	92.7	100.1	-	-	-	-
48	SMA14	1999	-	100.6	-	100.0	93.0	99.9	93.0	99.8
49	SMA16	1999	-	100.3	-	-	-	-	-	-
50	SMA11	2004	-	100.5	-	-	-	-	-	-
51	SMA16	2000	-	100.3	-	-	-	-	-	-
52	SMA11	2003	-	100.1	-	-	-	-	-	-
53	SMA16	1991	92.6	-	-	-	-	-	-	-
54	SMA16	1994	92.4	-	-	-	-	-	-	-
55	SMA16	2000	92.7	-	-	-	-	-	-	-
56	SMA16	1994	92.7	-	-	-	-	-	-	-
57	SMA11	2004	91.9	-	-	-	-	-	-	-
58	AC11	2004	91.4	-	-	-	-	-	-	-
59	AC11	2004	92.6	99.8	-	-	-	-	-	-
60	SMA8	2002	91.6	98.8	-	-	-	-	-	-
61	SMA11	2001	92.3	-	-	-	-	-	-	-
62	SMA11	2006	-	-	91.8	97.9	93.5	99.9	93.7	100.7
63	AC11	2002	92.5	99.7	92.4	99.3	91.1	98.5	-	-
64	AC16	2003	-	101.5	-	-	-	-	-	-
65	SMA16	1998	-	99.9	-	-	-	-	-	-
66	SMA11	2004	-	99.6	-	-	-	-	-	-
67	SMA11	2008	-	-	-	-	-	-	91.2	98.9
68	SMA16 Lane 4	1999	-	-	93.8	101.2	94.6	101.6	-	-
69	SMA16 Lane 3	2001	-	99.3	-	-	-	-	-	-
70	SMA11 Lane 3	2005	-	-	93.3	100.7	-	-	93.7	101.0
71	SMA11 Lane 4	2006	-	-	91.1	98.6	94.2	101.2	93.0	100.9
72	SMA11 Lane 1	2008	-	-	-	-	-	-	91.5	98.4
73	SMA16 Lane 3	1999	-	-	-	-	-	-	94.1	100.8
74	SMA11 Lane 2	2007	-	-	-	-	92.6	99.5	93.9	101.0
75	SMA11	2005	-	-	93.6	100.7	-	-	-	-
76	SMA11	2005	89.4	-	92.3	-	92.7	-	93.8	-
77	AC16	2001	92.7	-	92.6	-	-	-	-	-
78	AC16	1999	92.2	-	-	-	-	-	-	-
79	AC11	2005	-	-	93.7	101.1	-	-	-	-
80	SMA11	2008	-	-	-	-	-	-	90.9 <sup>1</sup>	97.2 <sup>1</sup>
81	AC11	2005	-	-	-	-	-	-	92.7 <sup>1</sup>	99.4 <sup>1</sup>
82	SMA16	2003	-	-	-	-	94.5	101.1	94.8	102.3
83	AC16	1992	-	-	-	-	-	-	94.2	-
84	SMA11	1998	-	-	-	-	-	-	93.9	100.7

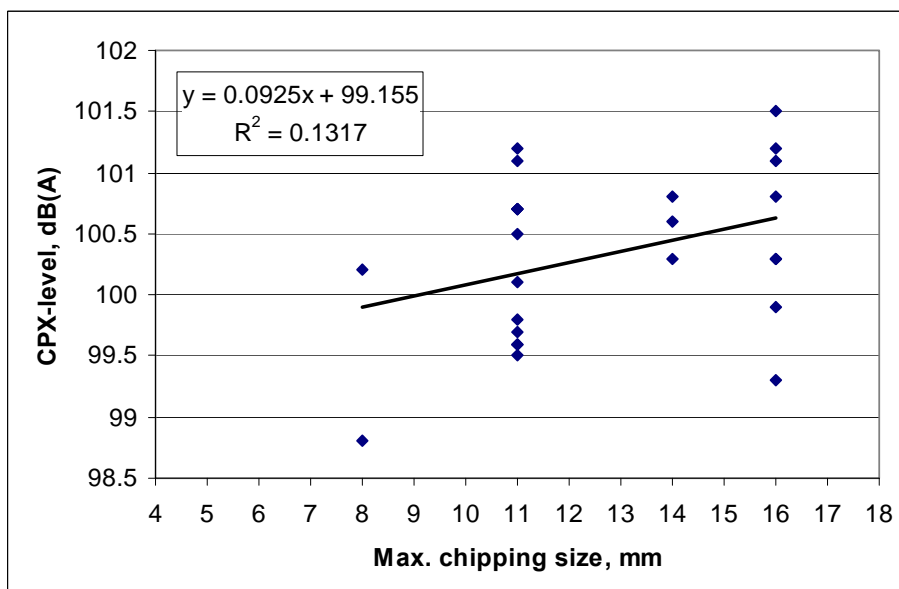
1) Measured with SRTT-tyre only

#### 6.4 Influence of maximum chipping size

The CPX-levels at 50 and 80 km/h as a function of maximum chipping size are shown in figures 17 and 18. These results are based on the normal dense pavements (No 38-82 in table 15), and only pavements exposed to one or more winter seasons are included. The figures shows individual results for each pavement.

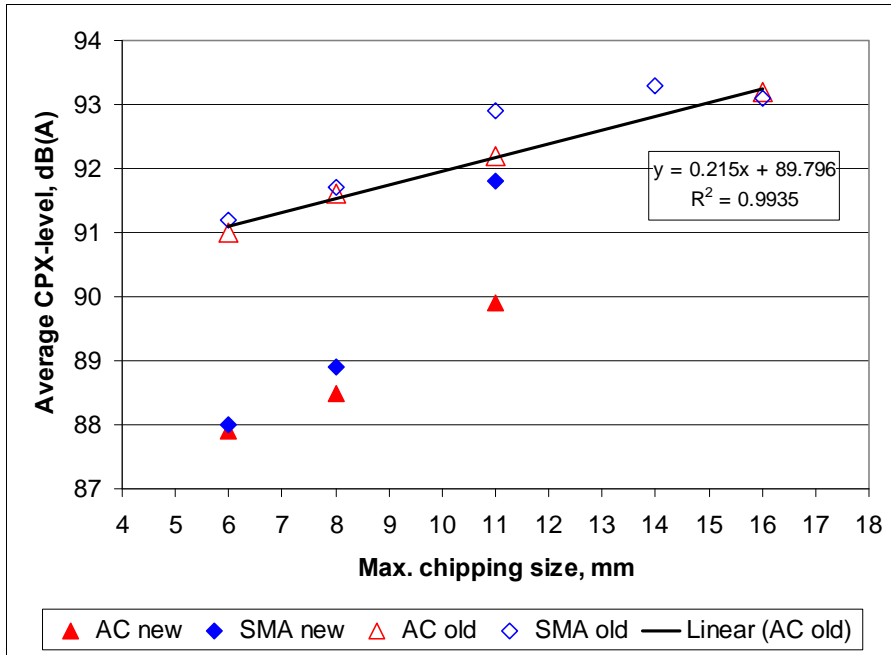


*Figure 17 CPX-levels as function of maximum chipping size, 50 km/h*

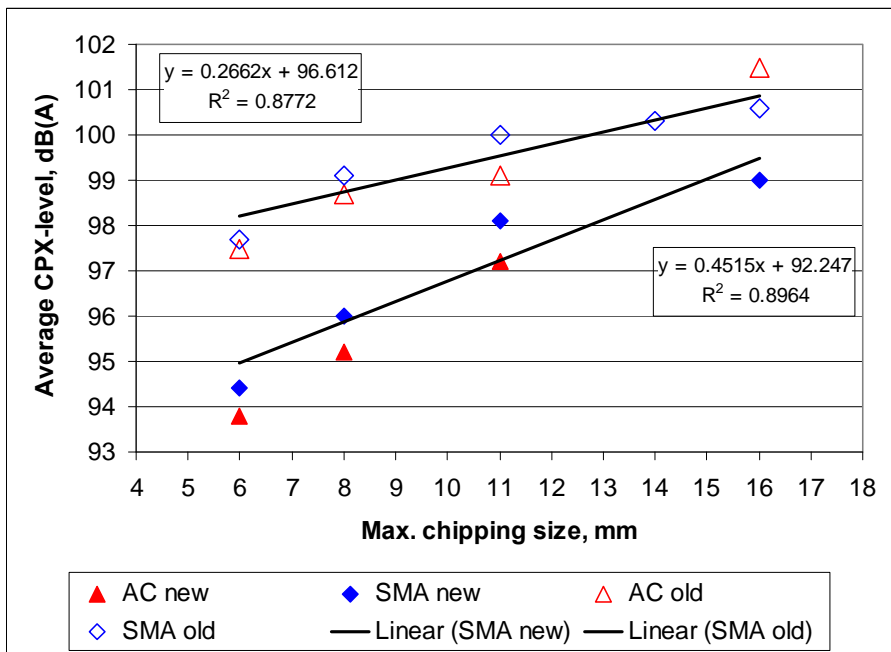


*Figure 18 CPX-levels as function of maximum chipping size, 80 km/h*

In figures 19 and 20, the influence of the maximum chipping size is shown, where the average levels for new layers (not exposed to winter conditions) and old layers have been calculated. These figures also include the results from the test pavements in table 1. In these figures, AC and SMA-pavements have been separated.



**Figure 19** Average CPX-levels as function of chipping size, 50 km/h



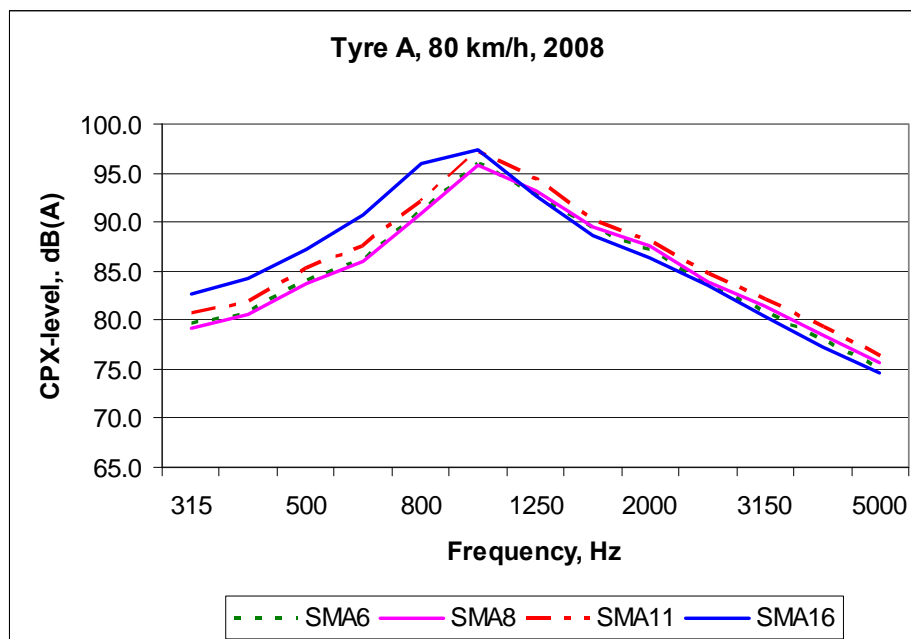
**Figure 20** Average CPX-levels as function of chipping size, 80 km/h

As can be seen from figure 19, the increase in levels due to increased maximum chipping size is about 0.2 dB(A) pr mm for “old” SMA/AC-pavements, which is in line with the proposed correction for chipping size (8-16 mm) in the Harmonoise/Imagine model [7]. For new pavements, the increase is somewhat higher (approximately 0.5 dB(A) per mm). However, the chipping size dependence is somewhat lower if the individual results are considered, as shown in figures 17 and 18, about 0.1-0.15 dB(A)/mm. The spread in the results are quite high and the correlation low, and should be taken into account in this evaluation.

The chipping size also influences the noise spectra. In figure 21, the frequency spectra for tyre A at 80 km/h at pavements 9-12 (E18 Mastemyr) is shown. On this location, there are 4 different pavements with chipping sizes from 6 to 16 mm (all SMA). All pavements are exposed to the



same traffic. The figure clearly shows that the smaller chipping size causes a lower noise levels below 1 kHz and it is assumed that this is due to texture related mechanisms.

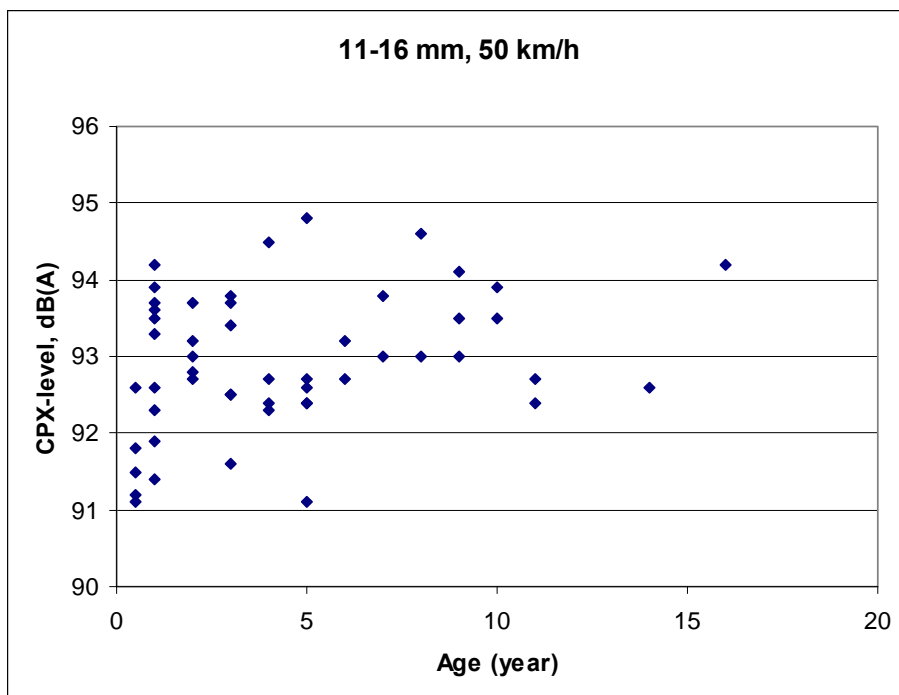


*Figure 21 Noise spectra for SMA-pavements with different chipping size*

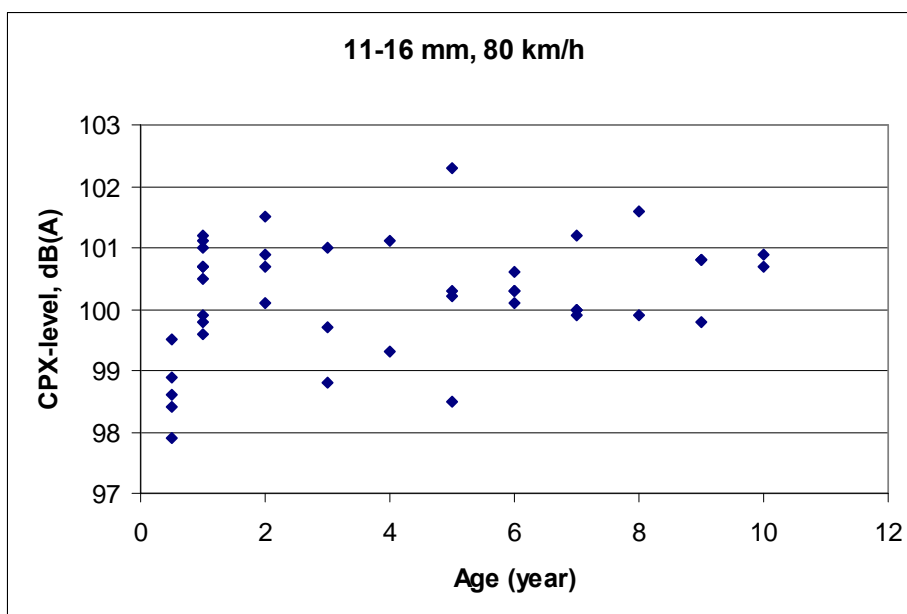
### 6.5 Influence of age

The measurements on dense pavements have been performed on pavements from a few weeks old up to 16 years. Independent of age, all pavements have been in good conditions (no cracks or wear damages).

The measurements results for pavements with a maximum chipping size of 11-16 mm are shown in figures 22 (50 km/h) and 23 (80 km/h). The data includes some measurements on the same pavement over more than one year (see table 15). All newly laid pavements, not exposed to a winter season have been given an age of 0.5 year.



*Figure 22 CPX-levels on SMA/AC-pavements 11-16 mm as a function of age. Speed: 50 km/h*



*Figure 23 CPX-levels on SMA/AC-pavements 11-16 mm as a function of age. Speed: 80 km/h*

Except for the new pavements (< 1 year old), there seems to be no correlation between noise levels and age, as long as the pavements are in good conditions. The spread in levels for pavements of the same age (at most 3-4 dB(A)) may be influenced by differences in traffic conditions, surface material properties, climate, etc. However, the results in Chapter 6.2, figures 4-9 show that if one consider one single road pavement, there is obviously an age dependency from the first year, and then the noise levels as a function of age seems more or less stabilised.

## 6.6 Homogeneity

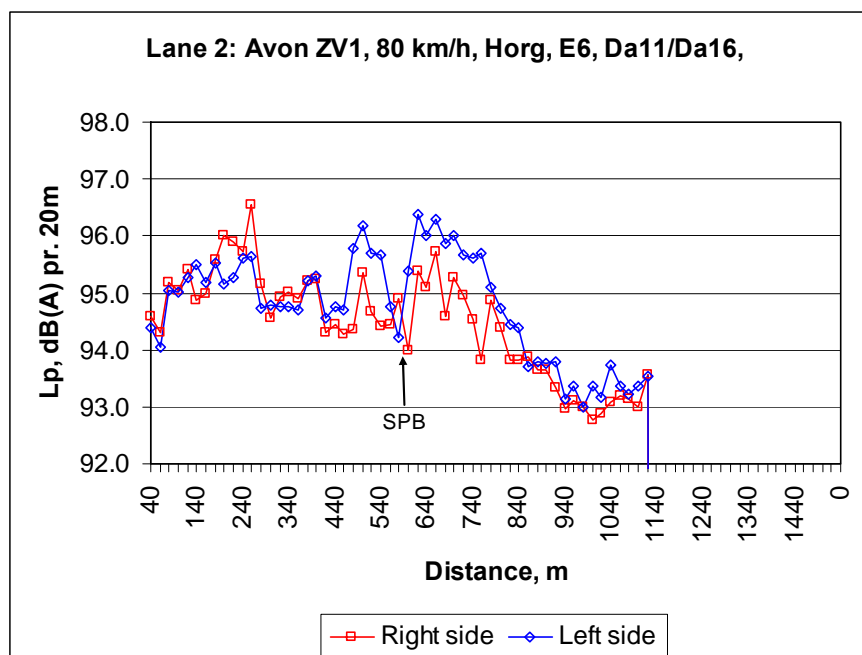
The CPX-trailer/CPX-method gives information of the homogeneity of the pavement by the measurement of the average level of every 20 m segment of the road section under investigation.

Such a measurement will be necessary to perform in order to evaluate if a pavement satisfy for example a homogeneity requirement of a classification system. In addition, it can be a valuable tool for a contractor to improve layering techniques in order to lay a homogenous pavement with respect to acoustical performance.

In addition, if a SPB-measurement is performed on the same road section as the CPX, the level vs distance can indicate the representativity of the SPB-level at the chosen location for this measurement.

On pavement 36 (double layer porous pavement), both CPX and SPB have been performed. In figure 24, the CPX-level as a function of distance is shown, together with an indication of the position of the SPB-measurement.

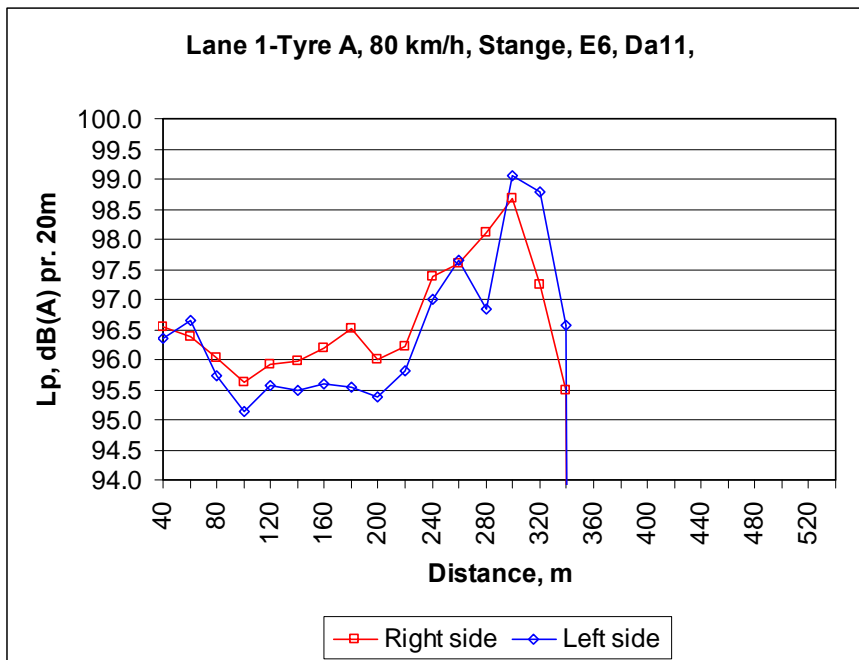
As the figure shows, the position of the SPB-measurement (chosen from site conditions), is on a position where the CPX-level is close to the total “average” level (94.7 dB(A)). Since this pavement is quite inhomogeneous (variation in level of more than 3 dB(A) and a standard deviation about 0.9 dB(A)), it clearly shows that the location of the SPB-measurement can be rather critical, if such a measurement is used solely to check if a pavement fulfil some sort of classification schemes.



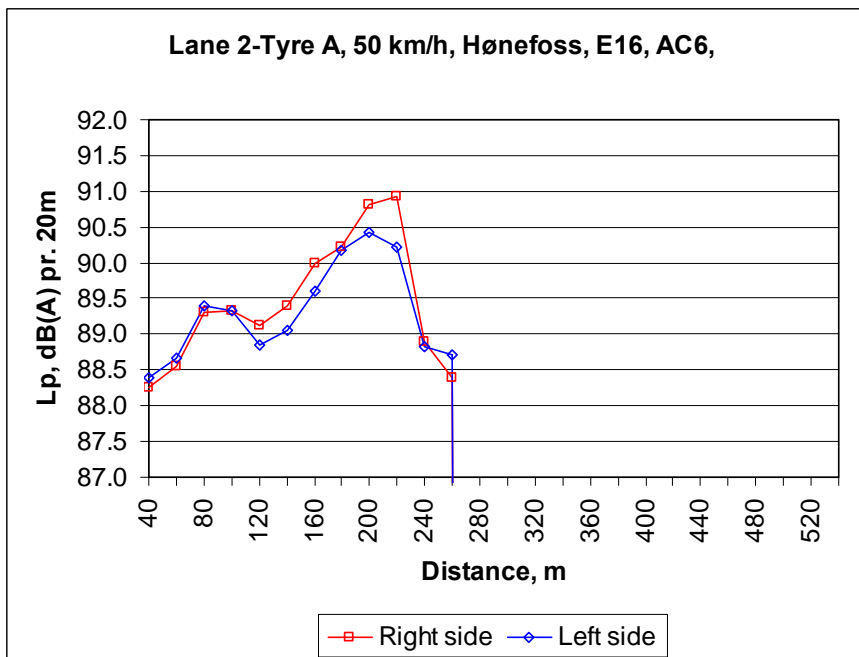
**Figure 24** Pavement 36: CPX-level as a function of measured distance. Speed: 80 km/h. New pavement

Another interesting result from this measurement is that the lowest levels are in the end of the test section. It may be related to the laying technique. If only the last 300 m of the test section is taken into account, the average level is reduced to 93.5 dB(A), a reduction of 1.2 dB(A). Texture analysis may also give a better understanding of this variability. Texture analysis of porous pavements is, however, not part of this project.

Other examples of inhomogeneous pavements are shown in figures 25 and 26.



**Figure 25** Pavement 19: Da11, Speed: 80 km/h. Age: 1 year



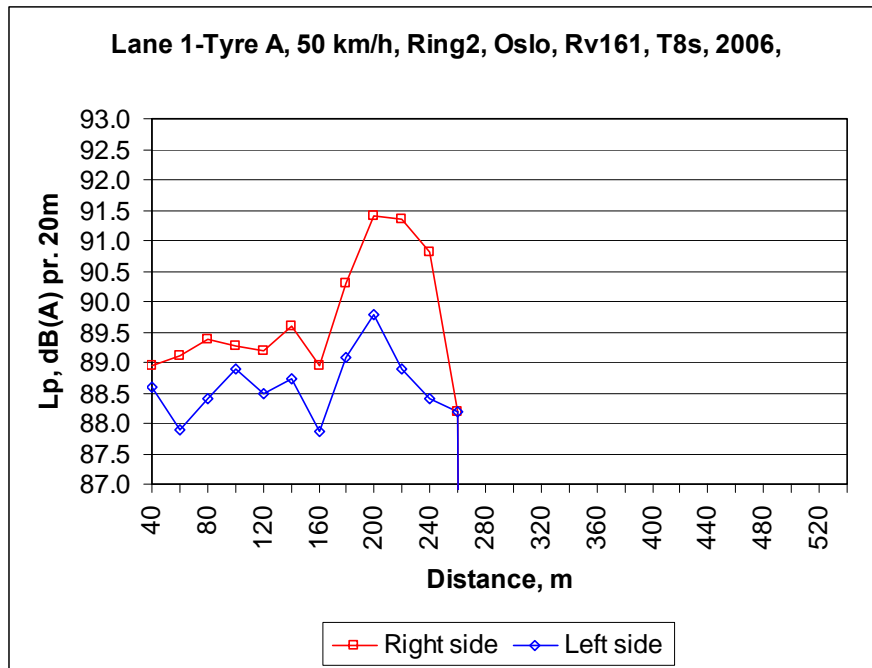
**Figure 26** Pavement 13: AC6, Speed: 50 km/h. Age: New

For both of these cases, the average sound level varied with 3-4 dB(A) over the measured distance.

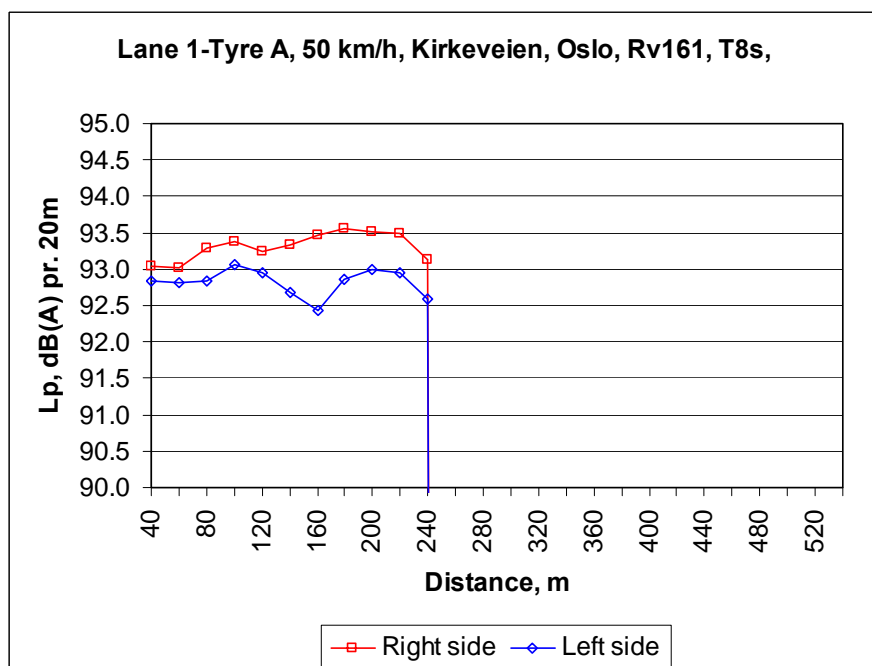
The average level (left and right side) over the measured distance of 340 m for pavement 19 as shown in figure 25 is 96.5 dB(A). If only the levels up to 240 m is included, the average level is 96.0 dB(A), so for this case the overall level is only influenced by 0.5 dB(A).

In some cases, the surface layer can be quite inhomogeneous when it is newly laid and before exposed to a winter season. Then, after one winter, the traffic exposure may have influenced the

texture in such a way, that the pavement becomes more homogeneous. One such example is from pavement no 23. Figure 27 show the levels measured when the pavement was new (in 2006) and figure 28 shows the same pavement in 2007, after approximately one year of traffic.

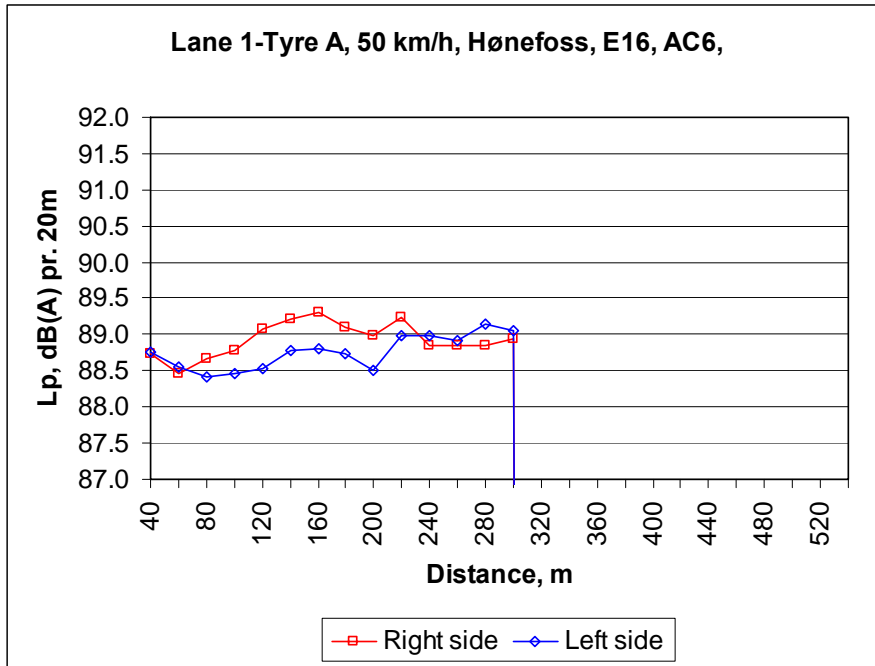


*Figure 27 Pavement 23: T8s, Speed: 50 km/h.  
Measurement in 2006 (new)*

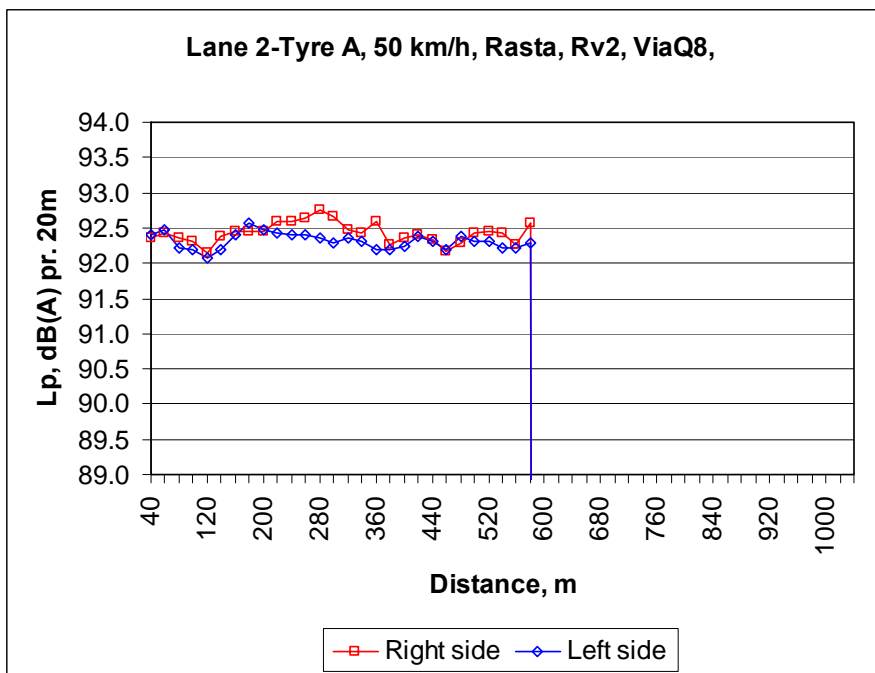


*Figure 28 Pavement 23: T8s, Speed: 50 km/h.  
Measurement in 2007 (one year old)*

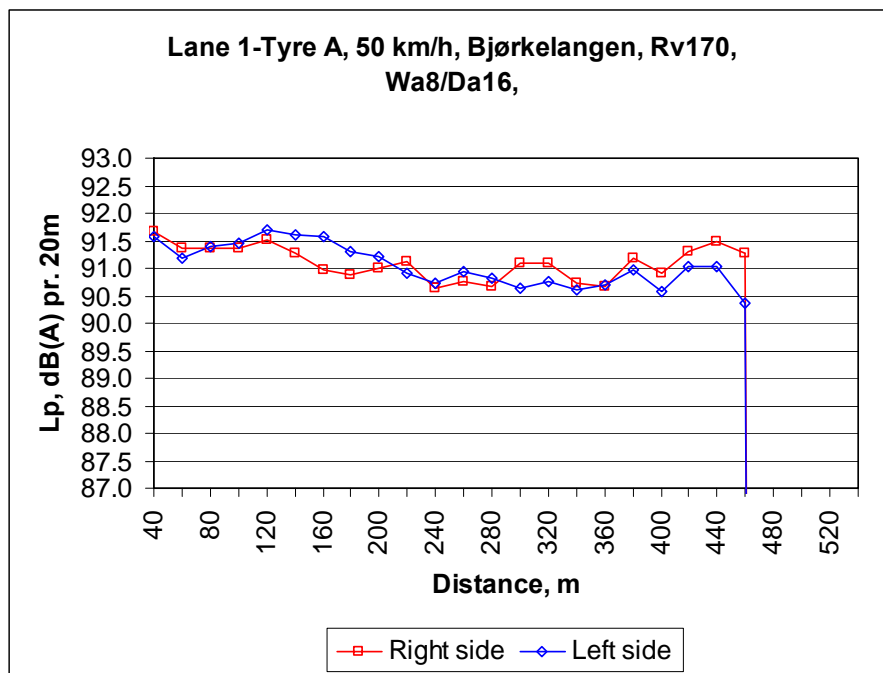
Examples of homogeneous pavements are show in figures 29-31.



**Figure 29** Pavement 13: AC6, Speed: 50 km/h.  
Measurement in 2005 (new pavement)



**Figure 30** Pavement 20: ViaQ8, Speed: 50 km/h.  
Measurement in 2007 (one year old)



**Figure 31** Pavement 25: Wa8/Da16, Speed: 50 km/h.  
Measurement in 2008 (two years old)

In general, the results show that if the standard deviation is below 0.2 dB, the spread in levels will normally be less than 1 dB. If a pavement should be considered as homogeneous, the standard deviation of the measured average level should not be more than 0.3-0.4 dB. This will normally lead to a variation in noise levels less than 1.5 dB.

### 6.7 Clogging

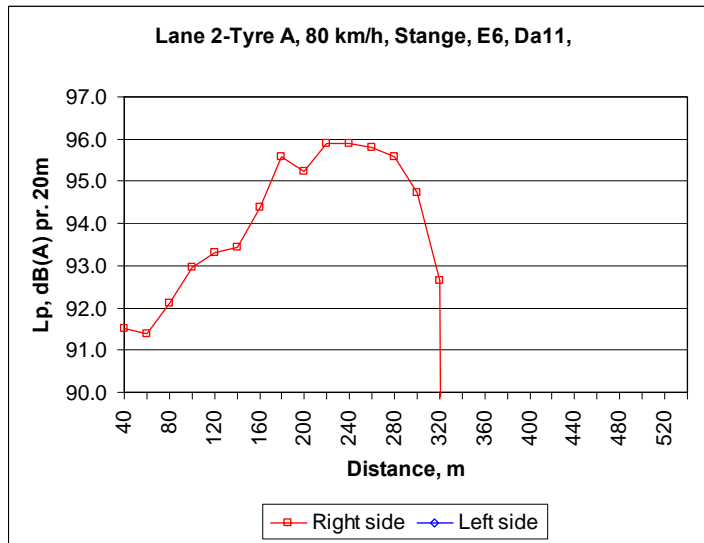
All open graded, porous road pavements will normally be clogged after being exposed to traffic over a certain time. In countries like Norway, Sweden and Finland, where studded tyres are widely used during the winter season, this effect is likely to reduce the noise reduction abilities for a porous pavement more rapidly than in other countries with no studded tyres. Some tests with open graded, double layer pavements on E6 north of Stockholm on a motorway with posted speed of 110 km/h, have shown that the relatively high speed of the passenger cars in some way reduces the effect of clogging. The tyres themselves act like a cleaning device.

Some of the test pavements with porous pavements (pavements 18, 19 and 24-27) are at locations with a posted speed of 80 km/h. It seems that this speed is not high enough to achieve this self cleaning effect from the traffic.

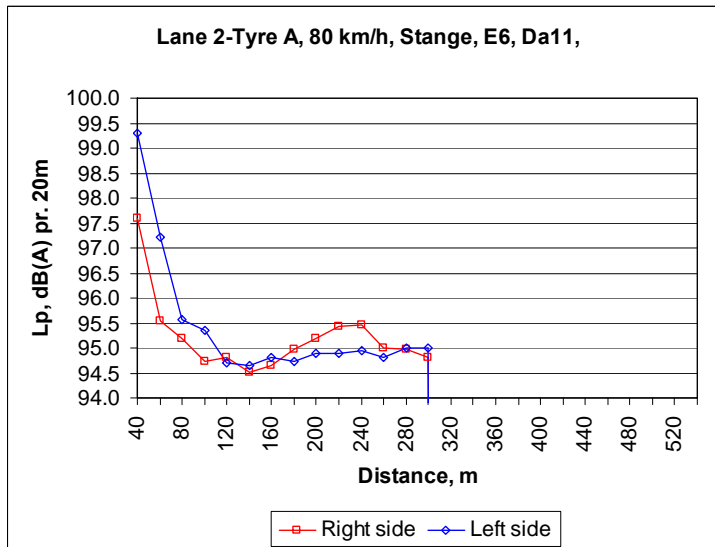
In figure 32, the measurements on pavement 19 (Da11) show no evident effect of clogging when it is quite new and before the first winter (but quite inhomogeneous).

The results one and two years later (2006-2007), show a clear indication of the clogging effect, see figures 33 and 34. The traffic in lane 2 moves from a traditional SMA0/14 pavement and into the Da11 and particles from the dense pavement can be transported to the porous pavement.

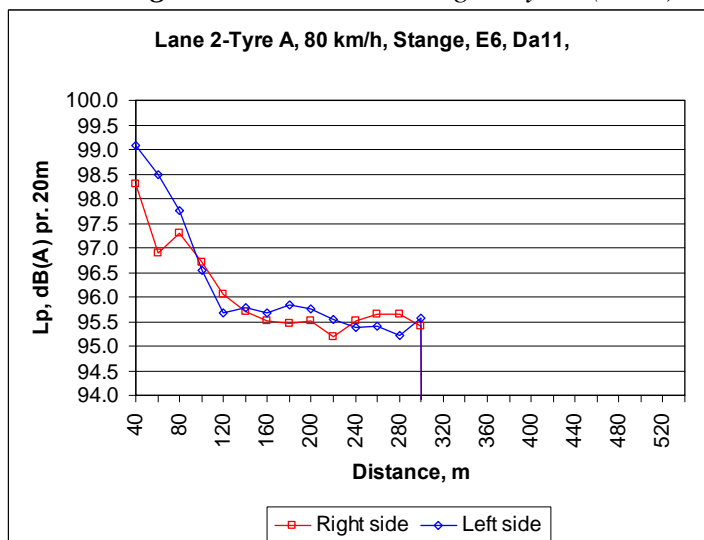
*Figures 32-34: Pavement 19: Da11 Lane 2, speed: 80 km/h*



*Figure 32 Pavement19. Age: New (2005)*



*Figure 33 Pavement19. Age: 1 year (2006)*

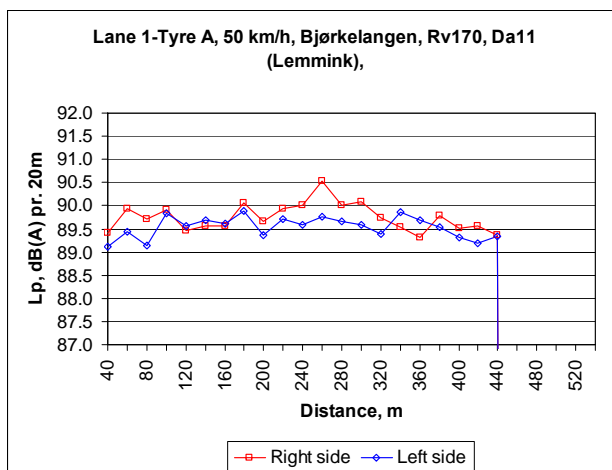


*Figure 34 Pavement19. Age: 2 years (2007)*

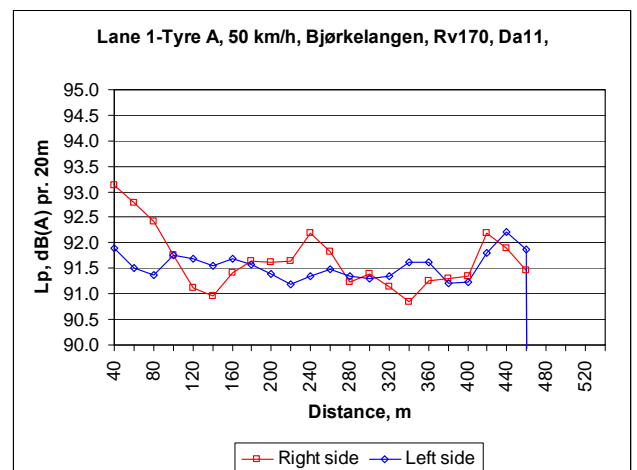


The clogging is affecting the acoustical performance for at least the first 100 m of the pavement. The average level of this measurement is based on the complete distance of 300 m. This average level is 96.5 dB(A) (table 14). If the first 120 m is excluded from the analysis, the level is reduced with approximately 1 dB(A).

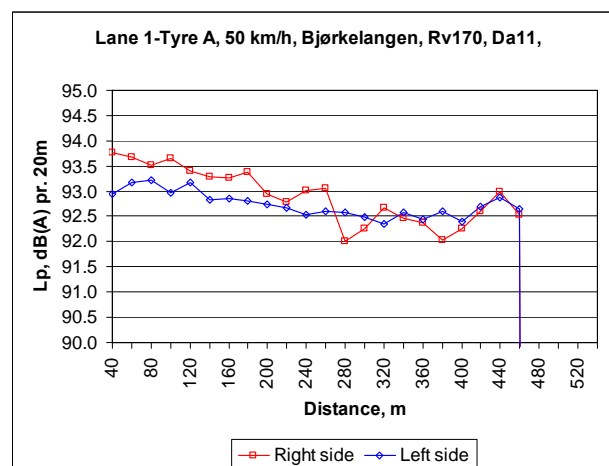
The pavements 24 (Da11-lane 1) and 27 (DaFib8/DaFib16 – lane 2) at the location Rv170, Bjørkelangen are laid next to a dense pavement (SMA0/11). The figures 35-37 show the effect of clogging on pavement 24 after one and two years of traffic. Pavement 27 has a similar behaviour (see Appendix 2).



**Figure 35** Pavement 24, Da11,  
Age: New (2006)



**Figure 36** Pavement 24, Da11,  
Age: 1 year (2007)



**Figure 37** Pavement 24, Da11,  
Age: 2 years (2008)

Both these pavements were tried to be cleaned in 2007 with no success, but unfortunately, the cleaning was not applied to the part of the pavements where the clogging is most apparent.

### 6.8 Repeatability

As stated in chapter 5, most of the measurements are based on 2 runs in each lane. In order to study the repeatability, measurements at the pavements 24-27 (porous pavements) were measured 5 subsequent times.

Tables 16-19 show the average CPX-level in dB(A) with tyre A on the left and right side of the trailer and the standard deviation for each of the 5 runs. All measurements are at 80 km/h and performed in 2008. All pavements are two years old.

**Table 16** Pavement 24: Da11

Run	Lane 1				Lane 2			
	Right side		Left side		Right side		Left side	
	Level	St.dev	Level	St.dev	Level	St.dev	Level	St.dev
1	100.1	0.47	99.9	0.34	99.4	0.49	99.6	0.44
2	99.8	0.53	99.8	0.34	99.3	0.44	99.5	0.23
3	100.0	0.35	99.5	0.24	99.4	0.43	99.4	0.21
4	99.7	0.58	99.6	0.24	99.1	0.42	99.5	0.23
5	100.1	0.41	99.5	0.35	99.2	0.42	99.7	0.29

**Table 17** Pavement 25: Wa8/Da16

Run	Lane 1				Lane 2			
	Right side		Left side		Right side		Left side	
	Level	St.dev	Level	St.dev	Level	St.dev	Level	St.dev
1	98.7	0.39	98.2	0.27	98.8	0.32	98.7	0.27
2	98.4	0.35	98.5	0.32	98.7	0.31	98.6	0.30
3	98.5	0.35	98.0	0.34	98.6	0.38	98.5	0.33
4	98.4	0.34	98.2	0.41	98.5	0.32	98.5	0.27
5	98.4	0.41	98.2	0.40	98.6	0.23	98.6	0.31

**Table 18** Pavement 26: ViaQ11/ViaQ16

Run	Lane 1				Lane 2			
	Right side		Left side		Right side		Left side	
	Level	St.dev	Level	St.dev	Level	St.dev	Level	St.dev
1	97.3	0.66	97.7	0.72	98.0	0.67	98.8	0.49
2	97.3	0.43	97.8	0.64	97.9	0.57	98.8	0.27
3	97.3	0.68	97.4	0.56	97.9	0.64	98.7	0.27
4	97.2	0.61	97.4	0.62	97.9	0.42	98.6	0.23
5	97.2	0.67	97.9	0.52	97.7	0.62	98.8	0.27

**Table 19** Pavement 27: DaFib8/DaFib16

Run	Lane 1				Lane 2			
	Right side		Left side		Right side		Left side	
	Level	St.dev	Level	St.dev	Level	St.dev	Level	St.dev
1	98.6	0.28	98.5	0.31	99.5	0.35	99.2	0.21
2	98.5	0.28	98.5	0.34	99.4	0.30	99.1	0.26
3	98.4	0.37	98.3	0.39	99.3	0.35	99.1	0.21
4	98.3	0.35	98.3	0.31	99.3	0.37	99.2	0.26
5	98.4	0.26	98.3	0.36	99.3	0.46	99.2	0.26

The results of this test show a good repeatability for the CPX-measurements concerning the average noise level. The standard deviation for pavement 26 is rather high for most of the measurements (> 0.5 dB), but most of the average levels are within 0.3 dB(A). The maximum difference is 0.5 dB for the left side on pavement 25 and 26 (lane 1).

In figures 38 and 39, the average level pr.20 m as a function of distance is shown for the measurements in lane 2 on pavement 24 (Da11). The speed is 80 km/h. The figures illustrates that

the general variation of level is about the same for each of the runs. Similar results were achieved also for the other 3 pavements (including pavement 26).

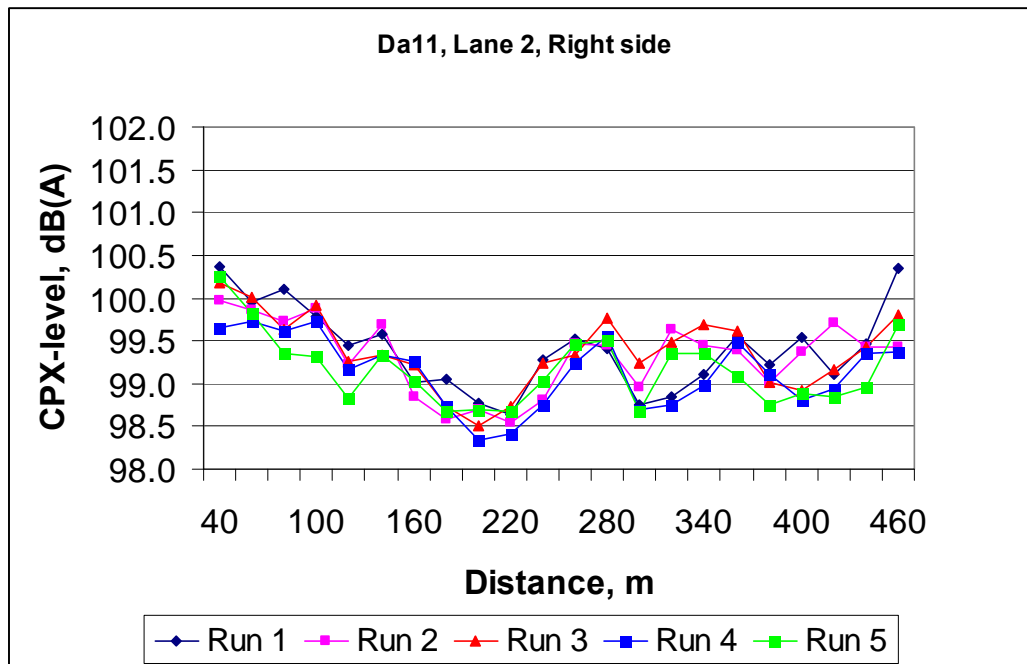


Figure 38 Pavement 24: Da11, Lane 2, right side. Repeatability of 5 runs

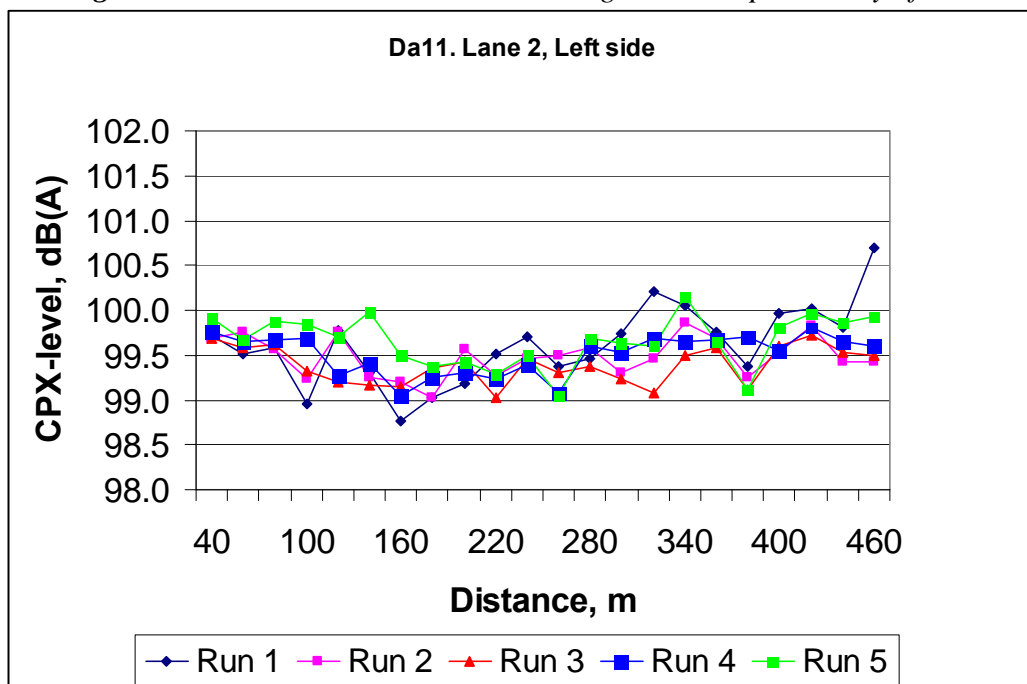


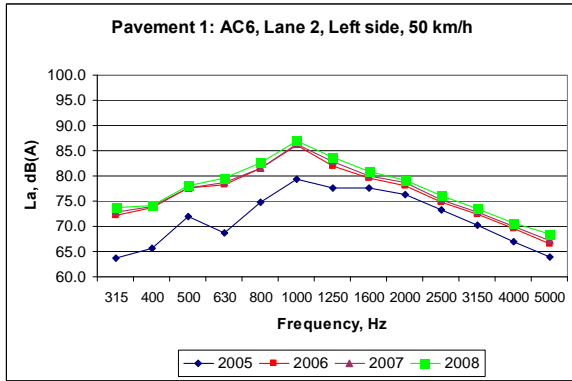
Figure 39 Pavement 24: Da11, Lane 2, left side. Repeatability of 5 runs

### 6.9 Frequency spectra

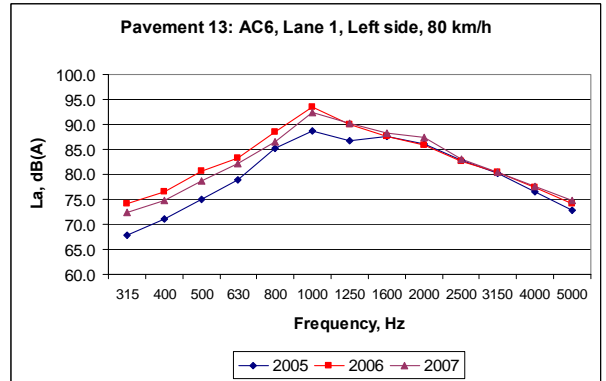
During all measurements, the A-weighted 1/3<sup>rd</sup> octave band frequency spectra from 315 Hz to 5 kHz have been measured. It is of interest to study any changes in spectra from the first year (without exposure of winter tyres) and after 2-3 years.

In addition, the differences in spectra for dense and porous pavements were also investigated.

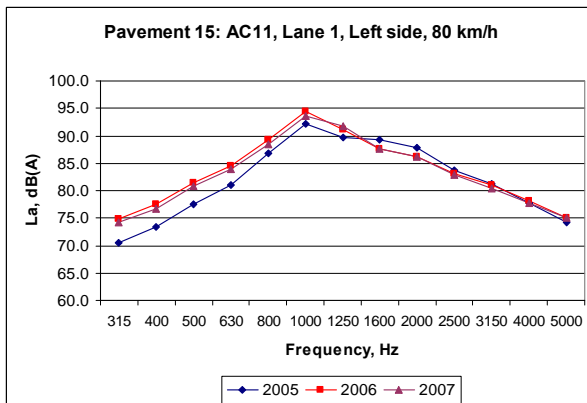
In figures 40-47, three dense AC- pavements, two SMA's, two single layer porous and one double layer porous pavement, have been chosen as examples of changes in the spectra. For simplifications, only the spectra on one side of the trailer have been chosen. All spectra are for tyre A, Avon ZV1.



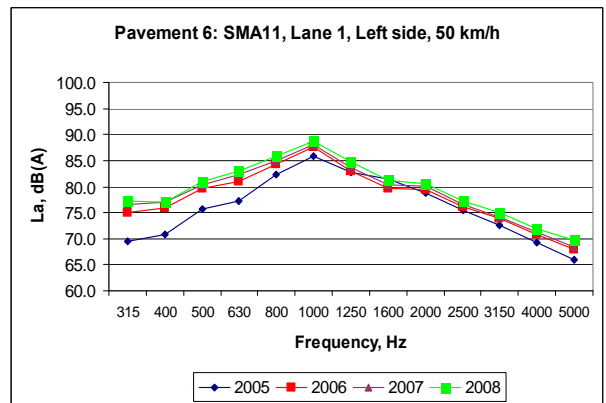
**Figure 40 Pavement 1: AC6**



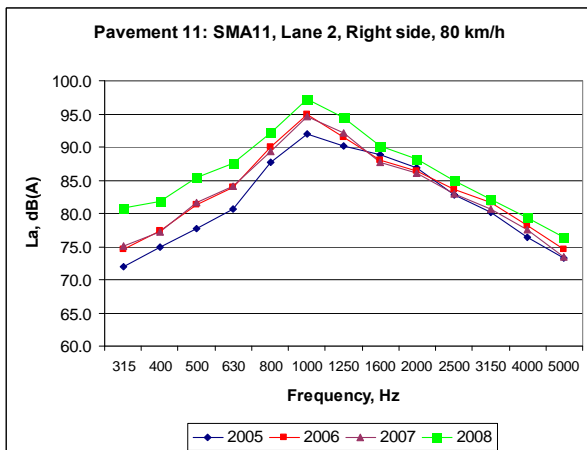
**Figure 41 Pavement 13: AC6**



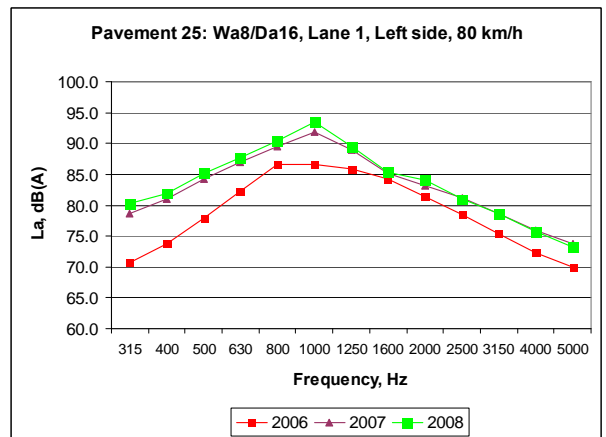
**Figure 42 Pavement 15: AC11**



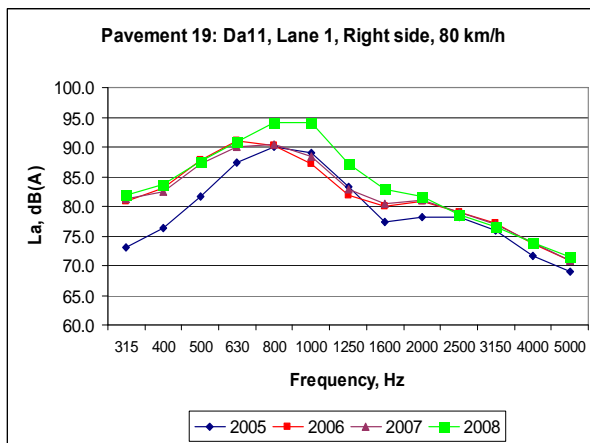
**Figure 43 Pavement 6: SMA11**



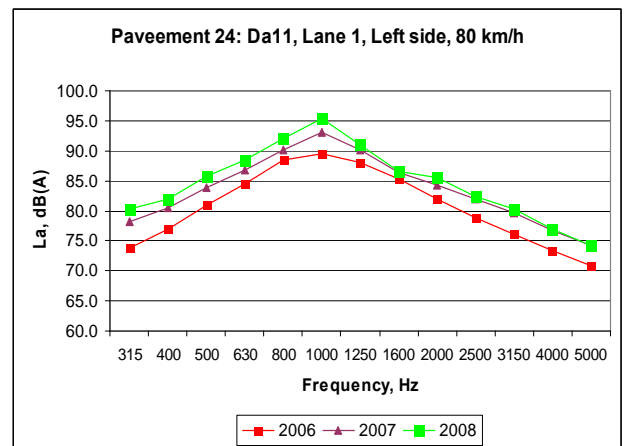
**Figure 44 Pavement 11: SMA11**



**Figure 45 Pavement 25: Wa8/Da16**



**Figure 46** Pavement 19: Da11

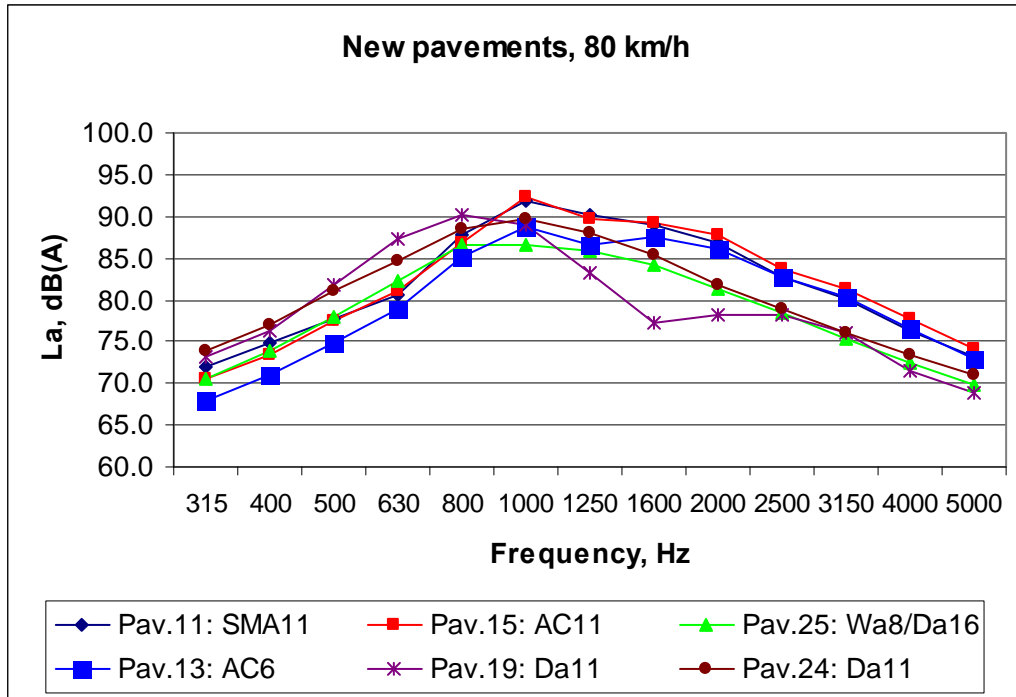


**Figure 47** Pavement 24: Da11

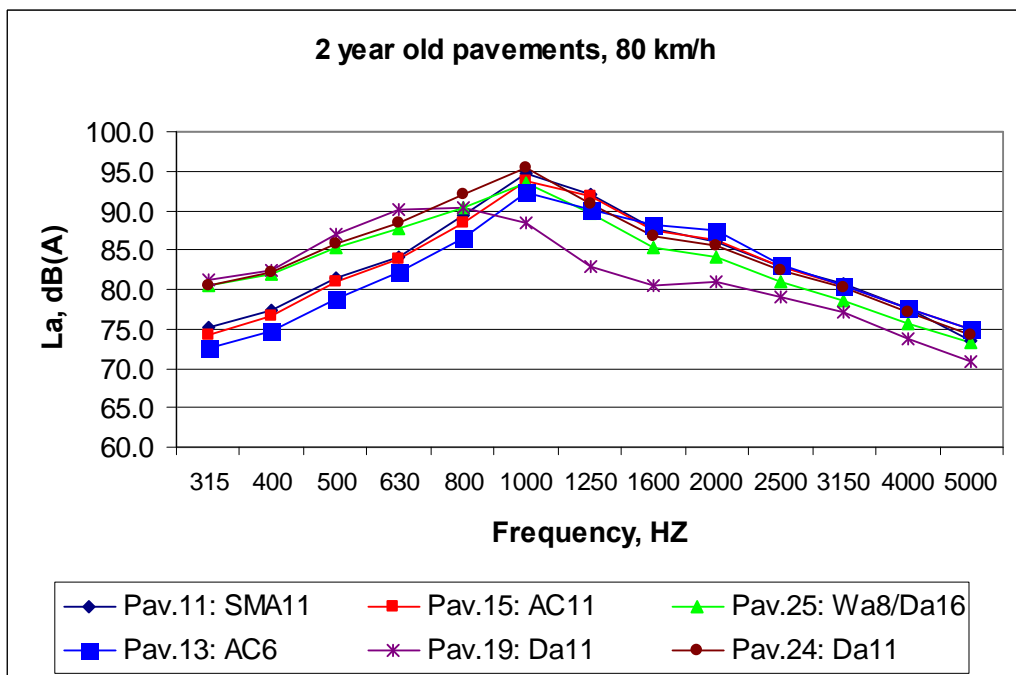
As previous shown, there is a consistent increase of the total levels after the first winter season. For the dense pavements, the increase is mostly in the frequencies from 1 kHz and below. For the porous pavement, the increase is significant in the whole frequency range, but highest in the lower part of the frequency range. For one of the SMA-pavements, figure 44, there is an additional increase in levels after the third winter season. This pavement is located on E18 outside Oslo, with relatively (for Norway) high traffic density (ADT =24400).

Pavement 19 is a single layer Da11 (figure 46) and shows some special features of the spectra. It has a different shape than a similar pavement (figure 47) with some absorption abilities in the frequency range around 1200-1600 Hz. The noise reducing properties in this frequency range seems to be kept also after some years of use.

In figures 48 and 49, the frequency spectra are compared for new pavements and after 2 years of traffic exposure (2 winter seasons). A selection of the pavements in figures 40-47 have been chosen for this comparison.



*Figure 48 New pavements*



*Figure 49 2 year old pavements*

Figure 48 show that the porous pavements give a lower level above 1 kHz, when the pavements are new. After 2 years of exposure, however, these pavements loose their absorption properties in the higher frequency range (above 1 kHz), see figure 49. Below 1 kHz, the porous pavements seem to have *higher* levels than the dense. This may be a negative factor for the porous pavements abilities to reduce indoor noise levels, and needs further investigation.

## 7 Additional measurements with new test tyres

As stated in chapter 2.1, ISO WG33 recently has chosen two new types of reference tyres, the Uniroyal Tigerpaw (ASTM SRTT) and the Avon AV4.

Since 2006, SINTEF has done parallel testing of the SRTT tyre and the “old” tyre A, Avon ZV1, as part of the basis for the selection of new test tyres.

Over the period 2006-2008, a total of 104 (50 km/h) and 74 (80 km/h) parallel measurements with tyre A and the SRTT have been performed. The results include both dense and porous pavements.

Table 20 show the average results at 50 and 80 km/h with the 2 tyres, and the difference in levels.

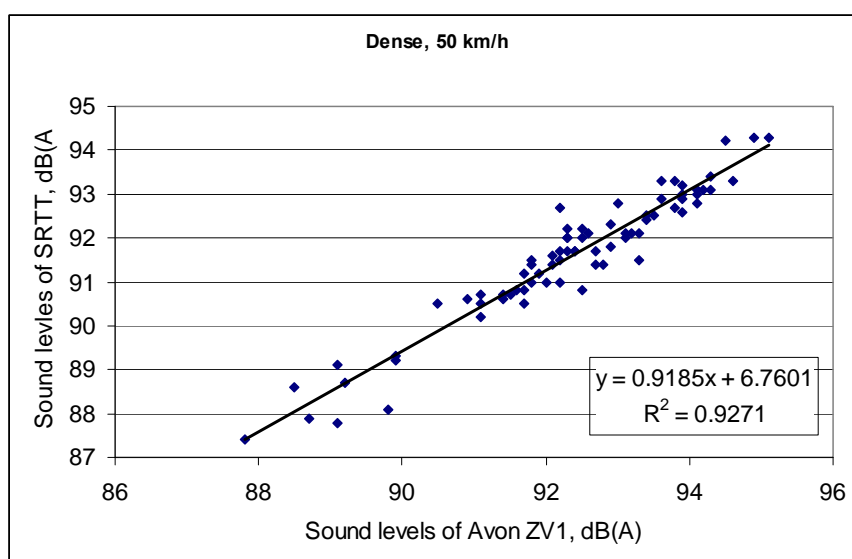
*Table 20 Average CPX-results with reference tyres*

Speed km/h	No of meas.	Tyre A Average level dB(A) [st.dev]	Tyre SRTT Average level, dB(A) [st.dev]	Average difference, dB(A)
50	104	91.7 [1.9]	90.9 [1.9]	0.8
80	74	98.4 [2.5]	97.5 [2.6]	0.9

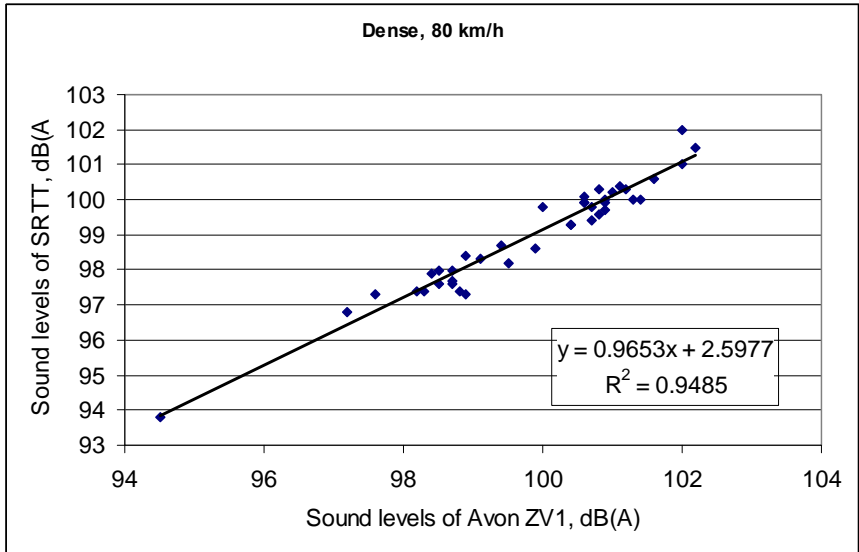
The SRTT gives on average 0.8-0.9 dB(A) lower levels than the Avon tyre.

The SRTT tyre is wider than the Avon ZV1 (225 mm vs. 185 mm) and this should normally give somewhat higher noise levels. However, differences in tread pattern (smaller tread blocks) could be one reason, but also differences in shore hardness could influence this level difference. The shore hardness of the Avon ZV1 measured in 2008 was 75 Shore A, while the SRTT was measured to 67 Shore A. A difference of 8 Shore A can in some cases cause a difference in noise levels of more than 1 dB(A) [6].

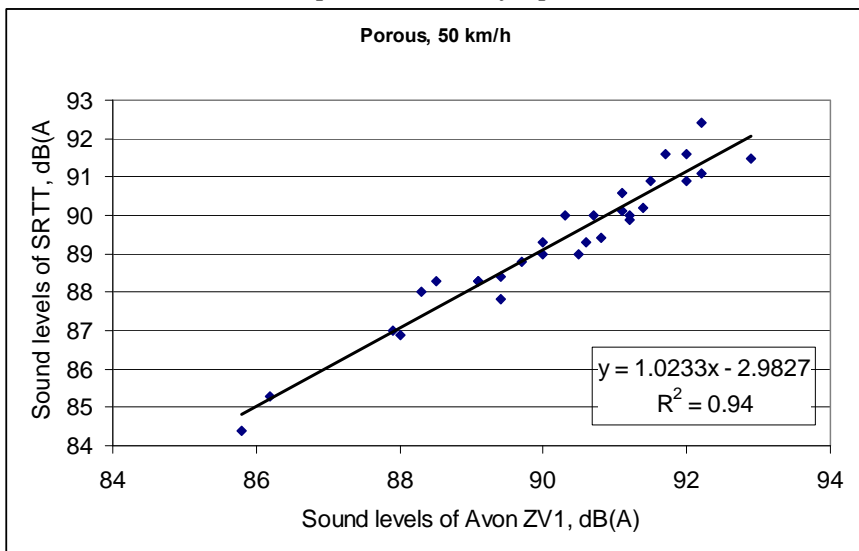
However, the correlation between the two tyres has been found to be rather high, and thus it can be concluded that the SRTT seems to be a good replacement tyre, also for our Norwegian pavement types. The correlation between the two tyres for dense and porous road pavements at 50 and 80 km/h is shown in figures 50-53.



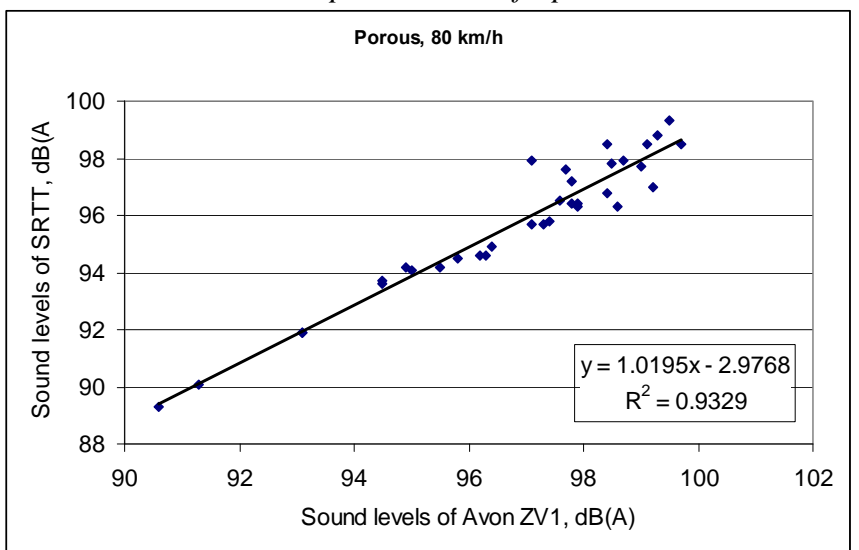
*Figure 50 Correlation between Avon ZV1 and SRTT.  
Dense pavements. Ref. speed: 50 km/h*



**Figure 51** Correlation between Avon ZV1 and SRTT.  
Dense pavements. Ref. speed: 80 km/h



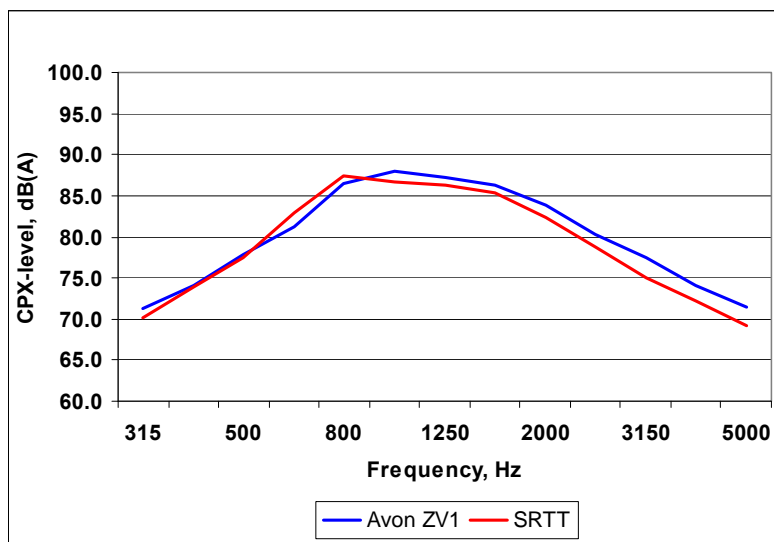
**Figure 52** Correlation between Avon ZV1 and SRTT.  
Porous pavements. Ref. speed: 50 km/h



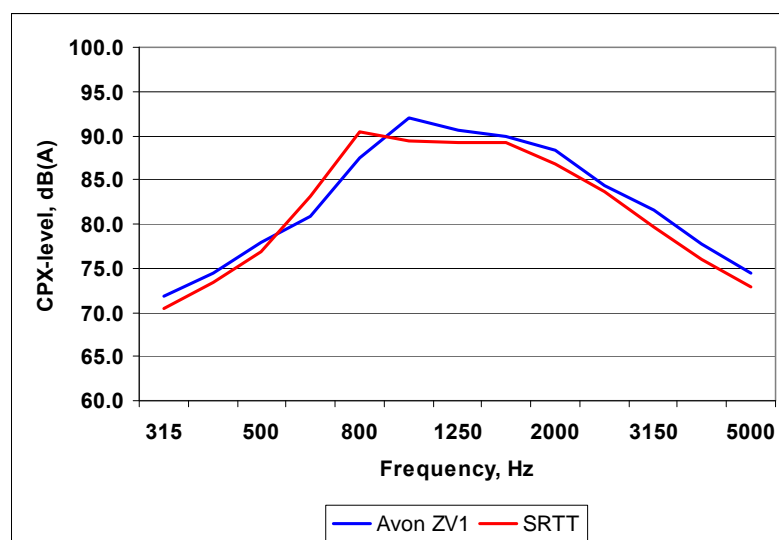
**Figure 53** Correlation between Avon ZV1 and SRTT.  
Porous pavements. Ref. speed: 80 km/h



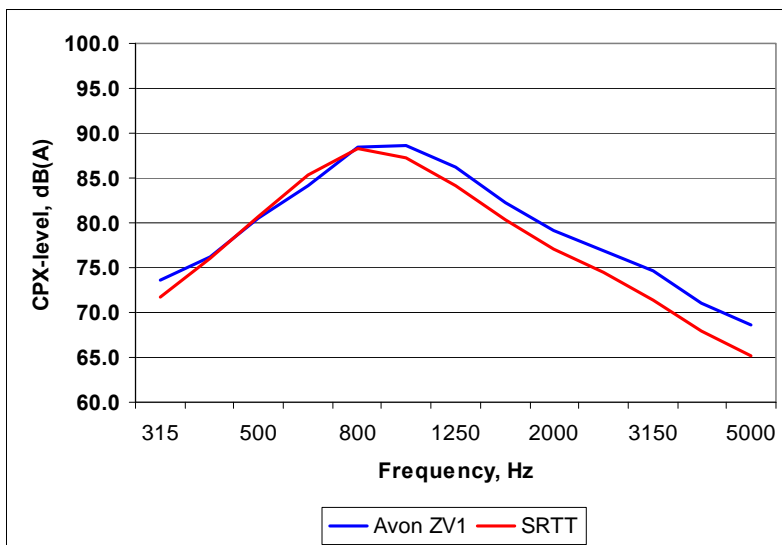
The parallel measurements with these two tyres have shown some differences in the spectra. In figures 54-58 the differences are illustrated on a selection of new and old pavements. All measurements are at 80 km/h. The differences in spectra are approximately the same at 50 km/h.



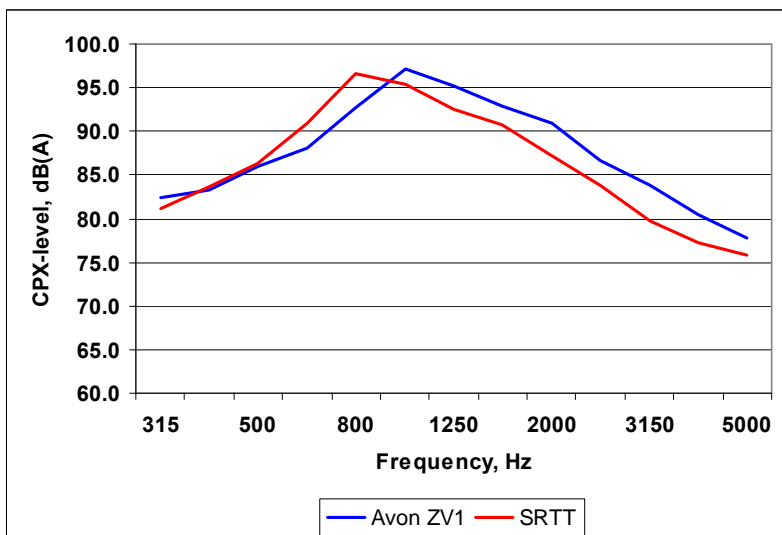
*Figure 54 Pavment30: SMA8, New*



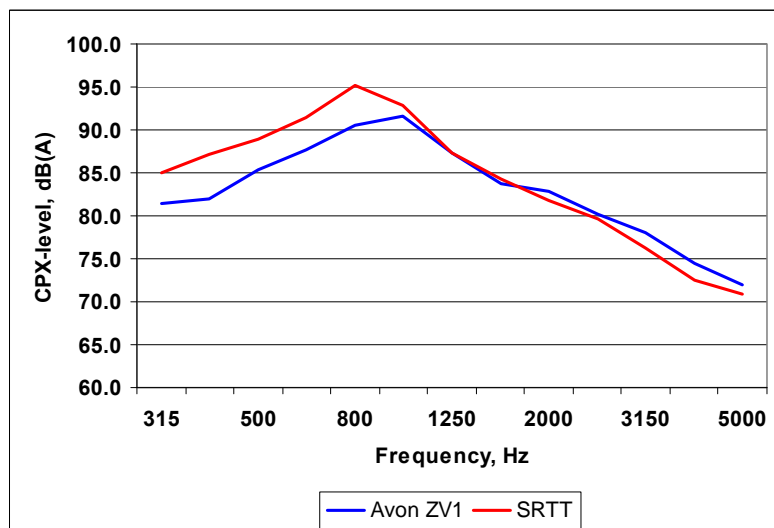
*Figure 55 Pavment62: SMA11, New*



*Figure 56 Pavment26: ViaQ11/ViaQ16, New*



*Figure 57 Pavment84: SMA11, 10 years old*



*Figure 58 Pavment26: ViaQ11/ViaQ16, 2 years old*

For both new and older pavements, the trend is the same; the SRTT-tyre has its peak at a lower frequency than the Tyre A (800 Hz vs. 1 kHz). The SRTT-tyre also has a lower noise level at frequencies above approximately 1 kHz, when the pavements are new. For two year old pavements this is also the case for dense pavements, but not for porous pavements. The frequency differences between these two tyres are not critical, when changing from tyre A to SRTT as a reference tyre.

Since the “old” tyre D (Dunlop Arctic SP, for heavy vehicles) was not available for use in this project, similar parallel testing of this tyre and the new replacement for tyre D, Avon AV4, has not been possible. Some measurements with this new tyre have been performed as part of the comparison between CPX and SPB-measurements, see chapter 8.

## 8 Statistical pass-by (SPB) measurements

The SPB-method has a set of requirements to fulfil with regards to both the measurement location and the required number of vehicles per classes. In order to fulfil the requirements for the number of heavy vehicles, a total of 80 individual heavy vehicles are needed, divided on 2 classes; 2 axles or 3 or more axles (multi axles). This requirement on heavy vehicles can sometimes be difficult, on locations with little traffic of heavy trucks.

Thus, the measurements done within this project have mainly been done to investigate the correlation between SPB and CPX-measurements with tyres representing each of the two categories (see chapter 2.1).

SPB-measurements have been performed at a total of 17 locations. On all these locations a minimum of 100 light vehicles have been measured, and on 14 of the locations, a sufficient number of heavy vehicles have been measured.

*Table 21 SPB and CPX-measurements.*

Pav. no	Surface type	Lane	Meas. year	SPBcars dB(A)	SPBtrucks, dB(A)		CPX, dB(A)		
					2 axles	≥ 3 axles	Tyre A	SRTT	Avon AV4
7	SMA11	3	2007	80.7	81.6	85.8	100.4	-	-
16	AC6	1	2007	79.6	86.0	88.2	99.1	99.0	99.1
24	Da11	1	2007	74.5	-	-	97.3	96.3	94.8
26	ViaQ11/16	1	2007	76.1	-	-	96.5	96.4	94.0
36	Da11/Da16	2	2008	73.0	77.0	79.9	94.7	93.6	92.4
48	SMA14	1	2007	81.5	82.7	86.9	102.6	101.7	99.4
62	SMA11	1	2007	79.5	-	-	101.9	100.9	97.9
67	SMA11	1	2008	78.7	82.2	85.4	98.8	98.4	95.8
71	SMA11	4	2006	80.5	83.6	85.0	98.6	97.4	-
72	SMA11	1	2008	81.9	82.1	83.8	98.5	97.6	95.1
73	SMA16	3	2008	83.4	83.8	85.9	100.8	100.4	97.0
75	SMA11	2	2006	80.6	82.4	85.3	100.7	99.7	-
79	AC11	1	2006	80.3	82.4	85.0	101.1	100.3	-
79 <sup>1</sup>	AC11	1	2008	80.2	80.5	83.0	-	100.1	97.4
80	SMA11	1	2008	77.8	82.5	85.1	-	97.2	95.1
81	AC11	1	2008	81.5	84.6	87.6	-	99.4	97.6
82	SMA16	2	2008	83.6	84.4	86.6	102.6	101.8	-

1) Measurements on the same road, but different section

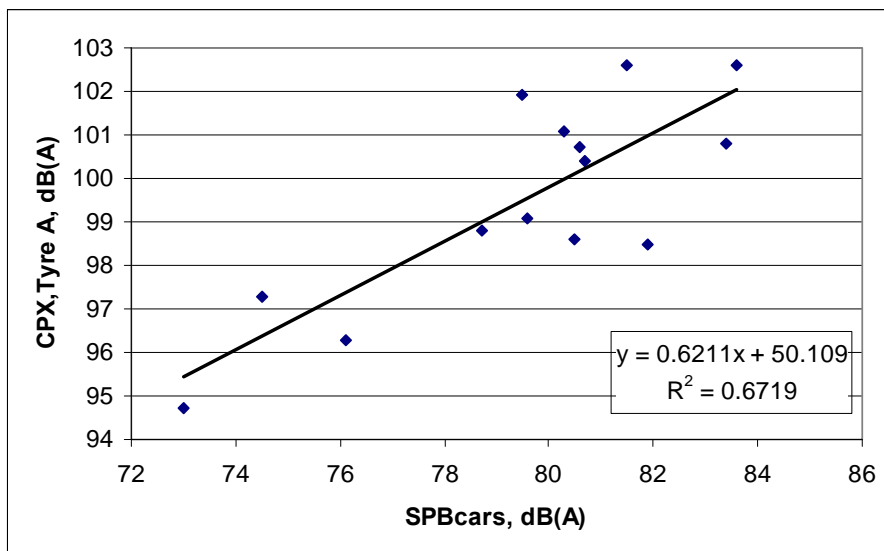
Table 21 shows the results of the SPB-measurements and the CPX-measurements on the same pavements. The reference speed for SPBcars and the CPX is 80 km/h, while 70 km/h for

SPBtrucks. The CPX-measurements reported for pavement 26 is from the measurements in September 2007.

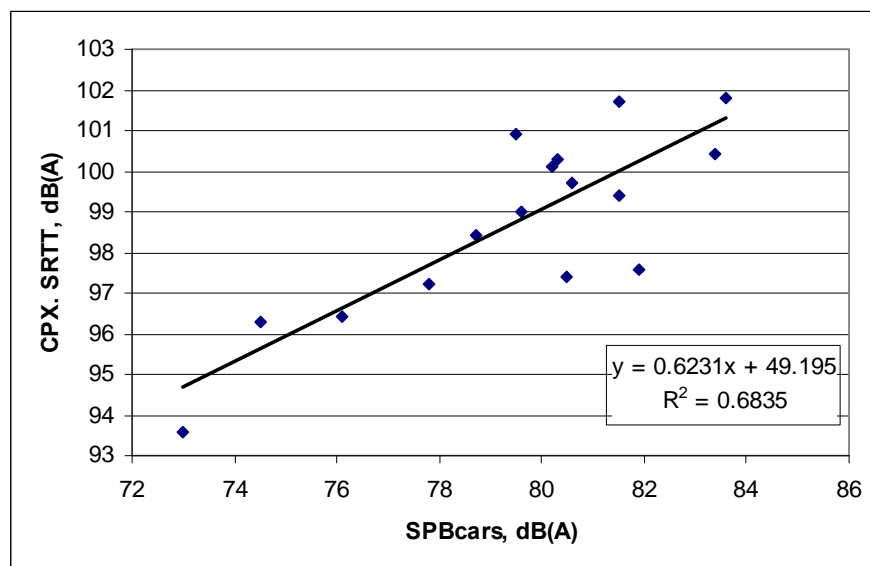
According to the CPX-results at the new double layer porous pavement 36 (E6, Horg), the noise reduction compared to older, “standard” SMA14/16-pavements, like pavement.48 and 82, the noise reduction is in the order of 8 dB(A), both with tyre A and the SRTT-tyre. With the Avon AV4, the difference is a little less, in the order of 7 dB(A).

The difference in SPB-levels for cars between this porous pavement and the SMA14/16 is in the order of 8.5-10.5 dB(A), a little higher than the CPX-results. For the trucks, the SPB-results seems to give a difference of 6-7 dB(A) between a new porous pavement and the old SMA14/16-pavements, thus the difference is in the range of what was measured with the Avon AV4-tyre.

The correlation between the SPBcars-values and the CPX-values for tyre A (Avon ZV1) is shown in figure 59, and with the SRTT-tyre in figure 60.

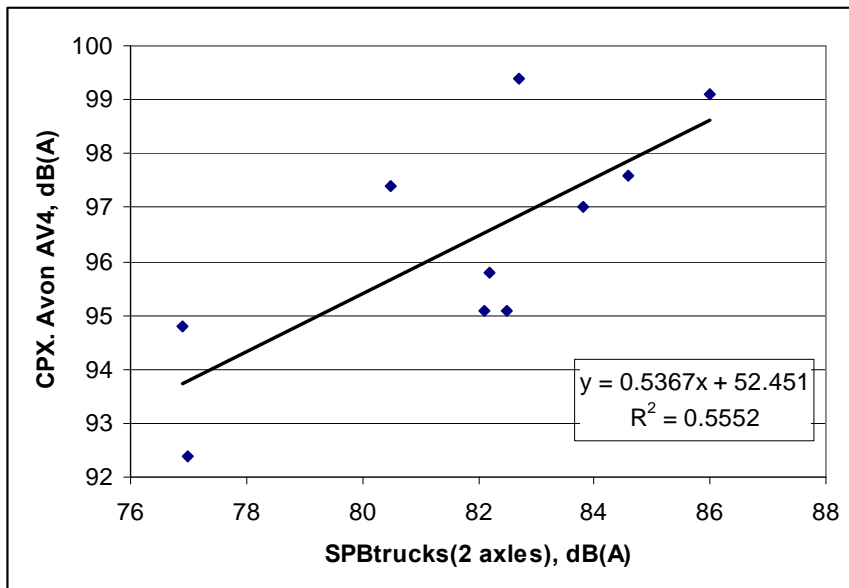


**Figure 59** Correlation between SPBcars and CPX-Tyre A.  
Reference speed: 80 km/h

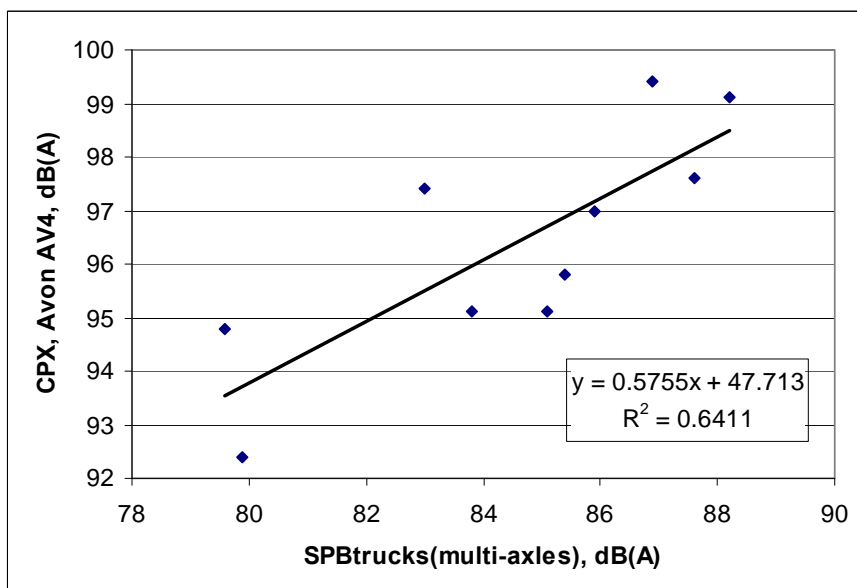


**Figure 60** Correlation between SPBcars and CPX-SRTT.  
Reference speed: 80 km/h

The correlation between the CPX-results for the Avon AV4-tyre and SPBtrucks with 2 axles is shown in figure 61 and for SPBtrucks with multi-axles in figure 62. The reference speed for the SPB-values are 70 km/h and for the CPX-values 80 km/h.



**Figure 61** Correlation between SPBtrucks (2 axles) and CPX-Avon AV4



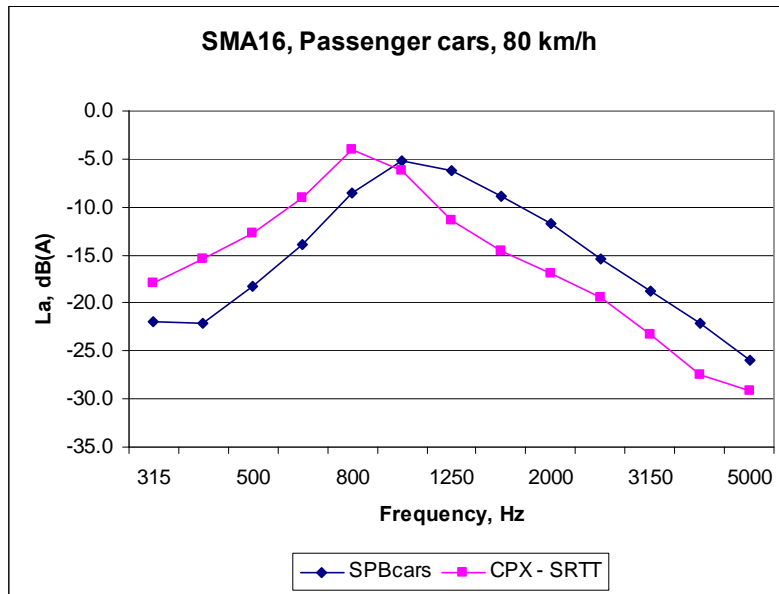
**Figure 62** Correlation between SPBtrucks (multi-axles) and CPX-Avon AV4

The correlation between the SPB and CPX-values for the new set of reference tyres, SRTT and Avon AV4, seems reasonable good, with a correlation coefficient in the order of 0.55-0.70.

There is a better correlation between the CPX-Avon AV4 and SPBtrucks with multi axles, than for the heavy vehicles with 2 axles only. A correlation coefficient in the order of 0.65 (80 km/h) is in line with other investigations [8].

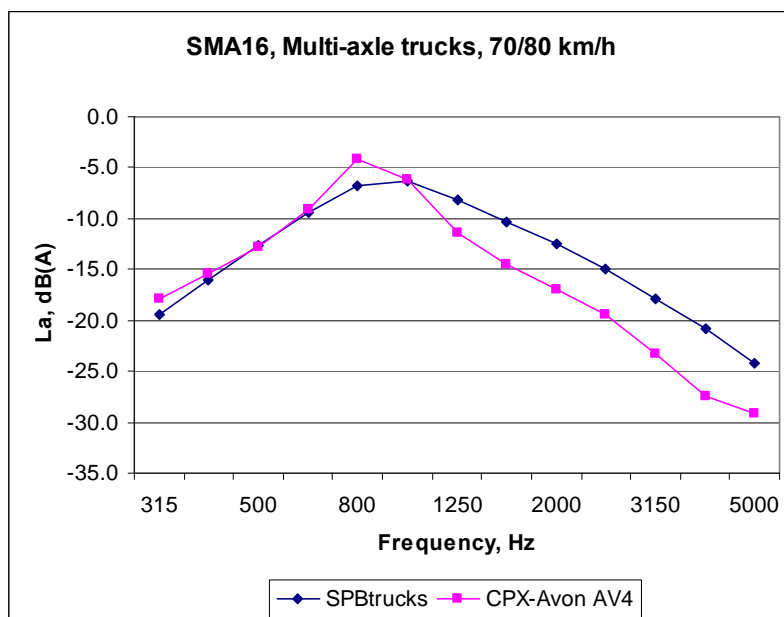
To investigate the new reference tyres representativity for the spectra for the two different classes of vehicles, passenger cars and multi-axles heavy vehicles, the noise spectra for CPX and SPB have been analysed.

Figure 63 show the normalised spectra for SPBcars and CPX with the SRTT-tyre on a 9 year old SMA16 pavement (no.73).



**Figure 63** Pavement73, SMA16. Normalised spectra for SPBcars and CPX-SRTT. Passenger cars at 80 km/h

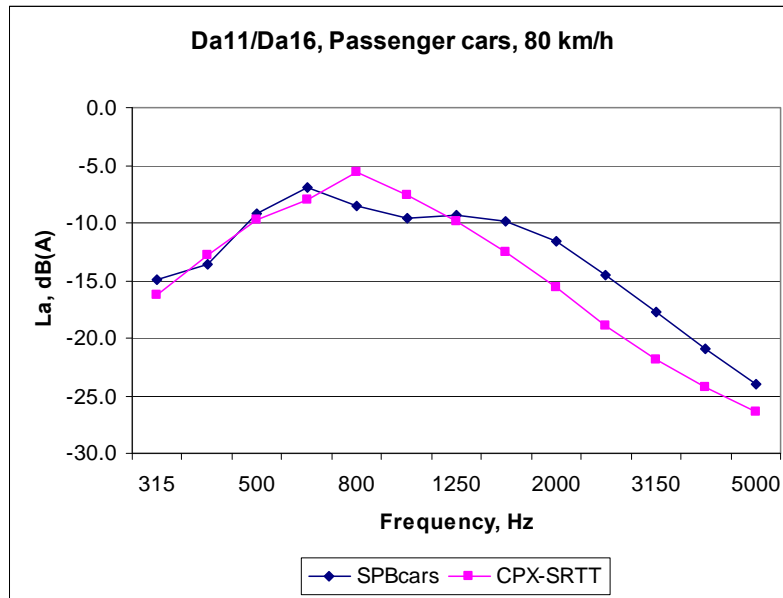
In figure 64, the same comparison is done for this pavement with normalised spectra for SPBtrucks and CPX with the Avon AV4-tyre.



**Figure 64** Pavement73, SMA16. Normalised spectra for SPBtrucks and CPX-Avon AV4. Multi-axle trucks at 70 km/h

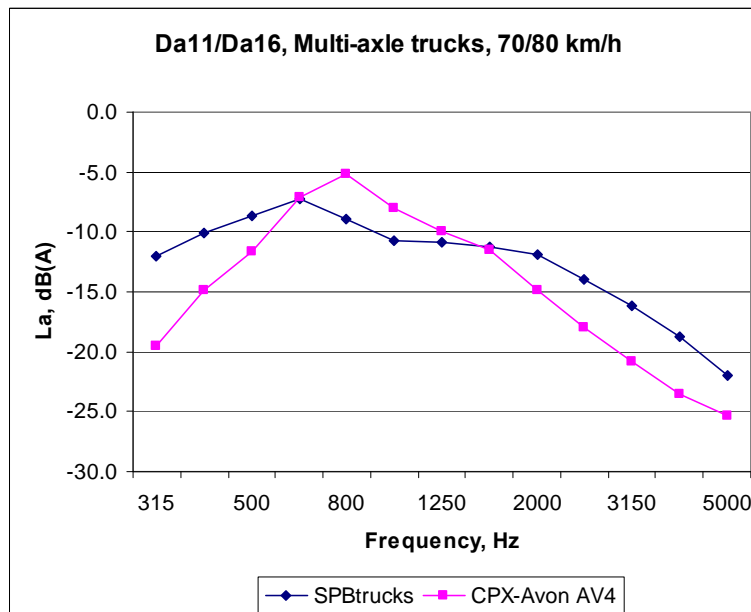
The results show that on this kind of dense pavement, both reference tyres underestimate somewhat the levels in the higher frequency range (above 1 kHz). The Avon AV4 seems to fit well in the lower frequency range, while the SRTT seems to overestimate somewhat in the lower frequency range, compared to the traffic noise spectra measured on this road.

On a newly laid double layer porous pavement (no.36), the situation seems to be a little different, as the SRTT-tyre seems to fit quite well in the lower part of the frequency range, see figure 65.



**Figure 65** Pavement36, Da11/Da16. Normalised spectra for SPBcars and CPX-SRTT. Passenger cars at 80 km/h

In figure 66, the normalised spectra for the porous pavement for SPBtrucks and CPX with the Avon AV4 tyre is compared.



**Figure 66** Pavement36, Da11/Da16. Normalised spectra for SPBcars and CPX-Avon AV4. Multi-axle trucks at 70 km/h

In general, there is a fairly good agreement between the reference test tyres and the SPB-spectra, but this needs to be investigated for a wider range of pavement types.

## 9 Uncertainties

### 9.1 General considerations

The measurement results presented in this report are influenced by a range of uncertainties. The uncertainty can be grouped in two categories:

1. Uncertainty due to changes in vehicle/trailer operation within consecutive runs (position of the trailer in the lane), changes in weather conditions (temperature), changes in background noise levels (passing of other vehicles), and measurement system uncertainty; (run-to-run variations), including acoustic calibration.
2. Uncertainty due to changing properties of a test location over time (measurement on the same pavement at different times) and changes in measurement system performance over longer periods; (day-to-day variations).

### 9.2 Run-to-run variations and homogeneity

In chapter 6.8 it has been shown that the run-to-run variation indicates an uncertainty in the range of 0.3-0.5 dB(A) concerning the overall average level, if 5 runs are repeated. If only 2 runs are averaged, the uncertainty is reduced to in the order of 0.2-0.35 dB(A).

The overall level is also depending on the homogeneity of the pavements. As shown in figures 25 and 26, an inhomogeneous pavement can give a variation in the levels of as much as 3-4 dB(A). This influences the standard deviation and the resulting level.

Figure 24 also show the influence of the position of a SPB-measurement on an inhomogeneous pavement and imply a high degree of uncertainty in the acoustical performance of a certain pavement type, if SPB is used for classification purposes.

### 9.3 Temperature influence

The CPX-measurements are influenced by the temperature (air, road surface and tyre temperatures).

Investigations [9] have shown that passenger car tyres normally have negative temperature dependence with regards to noise levels, i.e. when the temperature falls, the noise level increases.

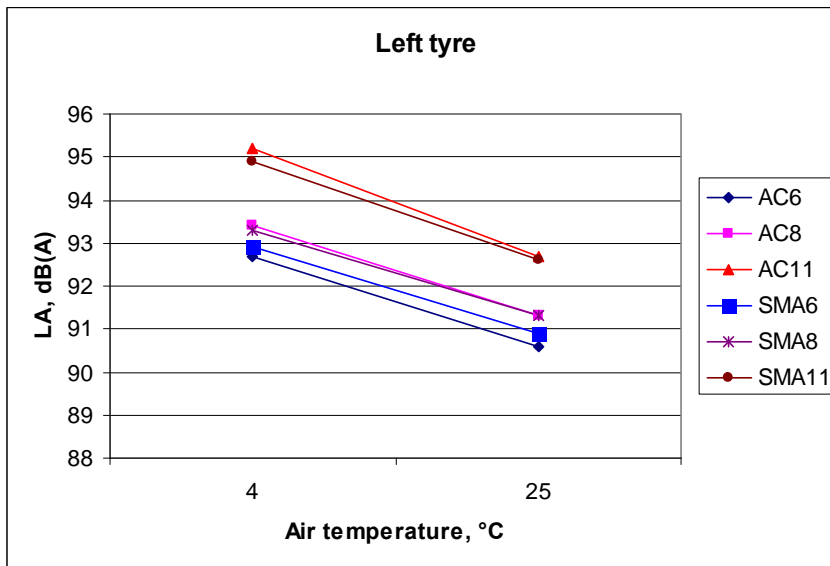
In a proposal for an ISO-standard for the influence of temperature in measurement of tyre/road noise (ISO/WD 13471-1), it is recommended to use a temperature (air) correction of  $-0.06 \text{ dB}/^\circ\text{C}$  for dense asphalt concrete pavements and  $-0.03 \text{ dB}/^\circ\text{C}$  for porous pavements. Reference temperature is  $+20^\circ\text{C}$ .

In this project these temperature corrections have been implemented.

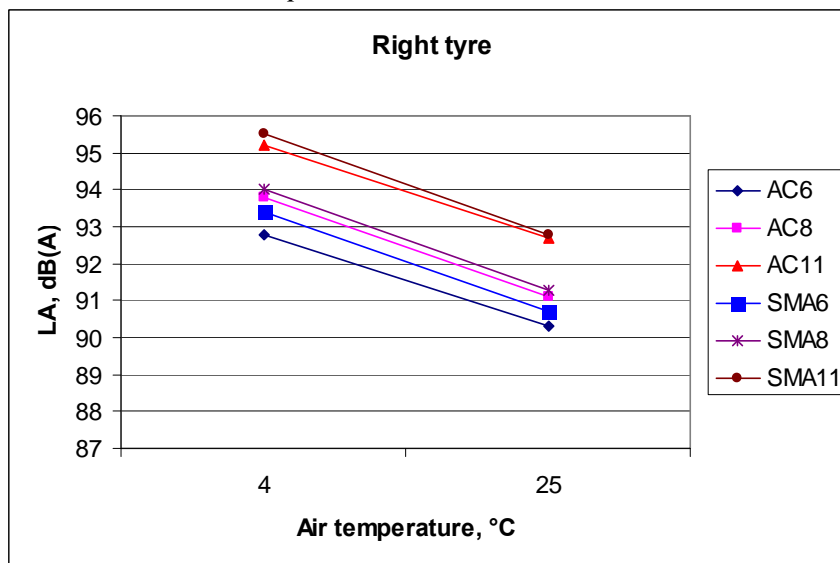
However, a special test was conducted with the two Avon ZV1 (Tyre A) used for the project. Two separate measurements were done at the pavements 1-6 in 2007 at 50 km/h. The first measurements were done in June with an air temperature of  $+25^\circ\text{C}$  and road surface temperature of  $+22^\circ\text{C}$ . The second part was done in October with an air temperature of  $+4^\circ\text{C}$  and road surface



temperature of  $-1^{\circ}\text{C}$ . Figure 67 and 68 show the resulting levels for the two tyres and table 22 the resulting coefficients.



*Figure 67 Temperature dependence of left tyre Avon ZV1 on dense pavements. Uncorrected levels*



*Figure 68 Temperature dependence of right tyre Avon ZV1 on dense pavements. Uncorrected levels*

*Table 22 Temperature coefficients, dB/°C*

Pavement No/Type	Avon ZV1	
	Right tyre	Left tyre
1 AC6	-0.12	-0.10
2 AC8	-0.13	-0.10
3 AC11	-0.12	-0.10
4 SMA6	-0.13	-0.10
5 SMA8	-0.13	-0.10
6 SMA11	-0.13	-0.11

As table 22 shows, the actual temperature dependence is measured to about the twice as recommended in the ISO-proposal, on average  $0.12\text{ dB}/^{\circ}\text{C}$ . The measurements have been conducted in a temperature range from  $+6$  to  $+25^{\circ}\text{C}$ . The ISO-proposed correction term from

+ 6 °C to the reference +20 °C gives a 0.8 dB(A) lower results than the “real” temperature dependence.

#### **9.4 Shore hardness**

The noise level is also depending on the shore hardness of the tyre. Recent investigations by VTI/TUG on more than 100 passenger car tyres indicates a influence of 1.0-1.5 dB(A) pr 10 units of shore hardness (Shore A) [6].

The shore hardness of both the two Avon ZV1 tyres and the two SRTT-tyres has been measured at the end of the measurement period in 2008.

The average value of the Shore A on the tread of the Avon ZV1 tyres has been measured to 75 Shore A (5 years old tyres), which indicates that the tyre rubber compound is rather hard. The SRTT tyres were measured to 67 Shore A (2 years old).

When comparing measurements made in 2005 with results in 2008, one has to take into account that the hardness of the test tyres could also influence the results. The hardness of the test tyres was not measured when the project started.

New passenger car tyres (summer tyres) would normally have a shore hardness around 60-65 Shore A. If one assume that the Avon ZV1 tyres had a shore hardness around 65 in 2005, it could indicate an increase in noise levels of about 1.0 dB(A) in the period from 2005-2008.

This influence illustrates the need to monitor the development of the shore hardness of all reference test tyres used for CPX-measurements.

#### **9.5 Speed corrections**

The measured sound levels according to the CPX-method depend on the speed of the trailer. In this project, the reference speeds have been chosen to be 50 and 80 km/h. During measurements, the speeds would vary around the chosen reference, and thus all measured levels have to be corrected to the reference speed. In the CPX-method, a speed correction method is given as a formula:

$$L_{\text{corr}} = L_{\text{meas}} + B \lg(v_{\text{ref}}/v)$$

where  $v$  is the actual speed and  $v_{\text{ref}}$  is the pre-selected reference speed.  $B$  is the speed constant (noise-speed slope) which has a (default) value of 35.

In this project, the default value of 35 has been used. For porous surfaces/low noise surfaces it is known that the speed dependence can be lower than 35 (more likely around 25-30). The use of the default value, rather than the exact speed slope for the pavement under investigation could introduce measurement uncertainty. If the real value of  $B$  is 25 instead of 35 at 50 km/h, the difference is in the order of 0.4 dB(A) if the actual speed is  $\pm 5$  km/h from the reference and in the order of 0.8 dB(A) if the speed is  $\pm 10$  km/h from the reference. At 80 km/h, the difference is around 0.3 dB(A) if the actual speed is  $\pm 5$  km/h from the reference and around 0.5 dB(A) if the speed is  $\pm 10$  km/h from the reference.

In a recent WG33-meeting, it has been proposed to change  $B$  to 30, to be in line with experience from measurements in the Netherlands, France and Austria.

In general, the influence of the uncertainty on the measured levels is not of a kind that changes the main conclusions in the report.

## 10 Conclusions and recommendations

In general, the noise monitoring of the test pavements over 2-3 years of traffic exposure, show a clear influence of the winter conditions in Norway, with the use of studded tyres.

Some of the test pavements (double layer porous) had an initial noise reduction related to CPX-measurements with tyre A (Avon ZV1) as much as 8-9 dB(A) below the chosen reference level at 50 and 80 km/h. Then, after 2-3 years of use, the noise reduction is significant less, in the order of 1-2 dB(A).

The choice of reference levels/reference system clearly influences the noise reduction values given for the individual pavements tested in this project.

The reference level has been chosen as a fixed level, independent of age, at 50 and 80 km/h based on measurements of existing pavements of AC 0/11 and SMA 0/11. It can be discussed if this is the best solution, as a new pavements (not exposed to winter seasons) of these types also have an initial noise level that can be 2-4 dB(A) below the reference. Clearly, the choice of reference value, related to either CPX-levels and/or SPB-levels have to be fixed before any type of classification scheme is applied for Norwegian roads.

Some of the tested porous pavements seem to deteriorate less acoustically after the first winter season, than after the second. The reason can probably be that the clogging effect is not so severe after the first winter season. A more effective cleaning technology for porous pavements needs to be tested and also a more detailed study of the texture changes for these types of pavements are also recommended.

The project results verifies that pavements with smaller maximum chipping sizes (6-8 mm) give a noise reduction of 1-2 dB(A) compared to the reference, after exposure to winter conditions.

Frequency analysis of porous pavements shows that the noise level at frequencies below 1 kHz can have higher levels than dense pavements. This may be a negative factor for these types of pavements to reduce indoor levels and needs further investigation.

In general, the behaviour of porous pavements needs to be further investigated. This includes texture analysis, the clogging effect, choice of stone material and binder, laying techniques, effect of cleaning, etc. This is necessary if such types of pavements shall be used as a mean to reduce traffic noise in Norway.

Optimisation of standard dense pavements and thin layers to achieve an increased acoustical lifetime is of interest. This relates to choice of material, mix types and laying/construction techniques.

The correlation between the frequency spectra from CPX and SPB-measurements has been investigated for a limited number of the test pavements. The results show a fairly good agreement, but needs to be investigated for a wider range of pavement types.

All CPX-measurements are influenced by air/road temperature. A generic temperature correction has been proposed by ISO, but it is recommended that the temperature influence of the test tyres used for measurements is investigated to establish individual correction factors, if necessary. Furthermore, the shore hardness of the test tyres used for CPX-measurements and its influence on the noise levels should also be investigated. It is recommended to monitor the shore hardness of

the test tyres, and they should be checked at least before and after a measurement season (twice a year).

## 11 References

- [1] S.Å.Storeheier: Miljøvennlige vegdekker: Resultater fra teksturmålinger 2006-2008. SINTEF Rapport A10917. Februar 2009 (in Norwegian).
- [2] ISO/WD 11819-2: 2008. Acoustics – Method for measuring the influence of road surfaces on traffic noise – Part 2: The close proximity method. Geneva, Switzerland: International Organisation for Standardisation.
- [3] ISO11819-1: 1997. Acoustics – Method for measuring the influence of road surfaces on traffic noise – Part 1: The statistical pass-by Method. Geneva, Switzerland: International Organisation for Standardisation.
- [4] B. O. Lerfald: Miljøvennlige vegdekker. Sluttrapport forsøksstrekninger. SINTEF Rapport SBF INA08012. 2008-10-30 (in Norwegian).
- [5] T. Berge: Miljøvennlige vegdekker-støy: Resultater fra CPX-målinger i 2007, sammenlignet med nivå i 2005 og 2006. SINTEF Notat 90E238.22, 2008-05-15.
- [6] U. Sandberg, J. Ejsmont: Influence of rubber hardness on tyre/road noise emission. Proceedings of Internoise 2007 in Istanbul.
- [7] H. G .Jonasson: Acoustic Source Modelling of Nordic Road Vehicles. SP Rapport 2006:12. Borås 2006.
- [8] W. Schwanen, G .J. van Blokland, H.M. van Leeuwen: Comparison of potential CPX-tyres. Report No.M+P.DWW.07.04. 13 February 2008.
- [9] U.Sandberg: Semi-generic temperature corrections for tyre/road noise. Proceedings of Internoise 2004 in Prague.

### Appendix 1. Measurement results (CPX) of typical Norwegian dense road pavements.

No	Surface layer	Prod. year	2005		2006		2007		2008	
			50	80	50	80	50	80	50	80
38	SMA11	2003	92.5	99.6	92.6	99.4	-	-	-	-
39	SMA14	1999	93.2	100.3	93.0	100.0	-	-	-	-
40	AC6	2003	91.4	-	-	-	-	-	-	-
41	AC6	2003	91.8	-	-	-	-	-	-	-
42	SMA8	2003	91.7	-	90.7	-	-	-	-	-
43	SMA8	2003	91.8	-	90.9	-	-	-	-	-
44	SMA11	2003	92.8	-	92.5	-	92.7	-	92.4	-
45	SMA11	2003	93.2	-	93.4	-	-	-	-	-
46	SMA14	1996	93.5	100.8	93.5	100.9	-	-	-	-
47	AC8	2000	92.4	100.2	92.7	100.1	-	-	-	-
48	SMA14	1999	-	100.6	-	100.0	93.0	99.9	93.0	99.8
49	SMA16	1999	-	100.3	-	-	-	-	-	-
50	SMA11	2004	-	100.5	-	-	-	-	-	-
51	SMA16	2000	-	100.3	-	-	-	-	-	-
52	SMA11	2003	-	100.1	-	-	-	-	-	-
53	SMA16	1991	92.6	-	-	-	-	-	-	-
54	SMA16	1994	92.4	-	-	-	-	-	-	-
55	SMA16	2000	92.7	-	-	-	-	-	-	-
56	SMA16	1994	92.7	-	-	-	-	-	-	-
57	SMA11	2004	91.9	-	-	-	-	-	-	-
58	AC11	2004	91.4	-	-	-	-	-	-	-
59	AC11	2004	92.6	99.8	-	-	-	-	-	-
60	SMA8	2002	91.6	98.8	-	-	-	-	-	-
61	SMA11	2001	92.3	-	-	-	-	-	-	-
62	SMA11	2006	-	-	91.8	97.9	93.5	99.9	93.7	100.7
63	AC11	2002	92.5	99.7	92.4	99.3	91.1	98.5	-	-
64	AC16	2003	-	101.5	-	-	-	-	-	-
65	SMA16	1998	-	99.9	-	-	-	-	-	-
66	SMA11	2004	-	99.6	-	-	-	-	-	-
67	SMA11	2008	-	-	-	-	-	-	91.2	98.9
68	SMA16 Lane 4	1999	-	-	93.8	101.2	94.6	101.6	-	-
69	SMA16 Lane 3	2001	-	99.3	-	-	-	-	-	-
70	SMA11 Lane 3	2005	-	-	93.3	100.7	-	-	93.7	101.0
71	SMA11 Lane 4	2006	-	-	91.1	98.6	94.2	101.2	93.0	100.9
72	SMA11 Lane 1	2008	-	-	-	-	-	-	91.5	98.4
73	SMA16 Lane 3	1999	-	-	-	-	-	-	94.1	100.8
74	SMA11 Lane 2	2007	-	-	-	-	92.6	99.5	93.9	101.0
75	SMA11	2005	-	-	93.6	100.7	-	-	-	-
76	SMA11	2005	89.4	-	92.3	-	92.7	-	93.8	-
77	AC16	2001	92.7	-	92.6	-	-	-	-	-
78	AC16	1999	92.2	-	-	-	-	-	-	-
79	AC11	2005	-	-	93.7	101.1	-	-	-	-
80	SMA11 <sup>1)</sup>	2008	-	-	-	-	-	-	90.9	97.2
81	AC11 <sup>1)</sup>	2005	-	-	-	-	-	-	92.7	99.4
82	SMA16	2003	-	-	-	-	94.5	101.1	94.8	102.3
83	AC16	1992	-	-	-	-	-	-	94.2	-
84	SMA11	1998	-	-	-	-	-	-	93.9	100.7

1) Measured with SRTT-tyre only

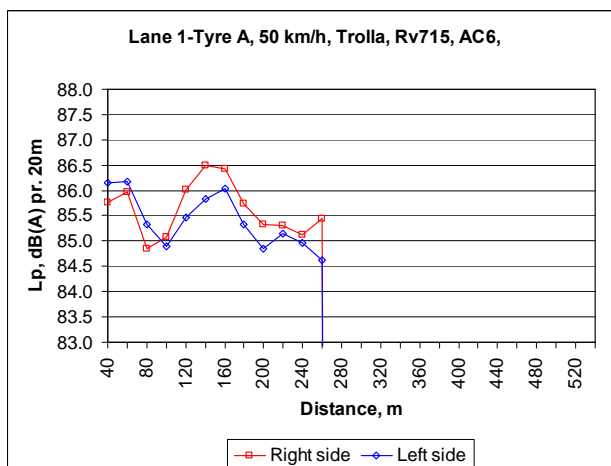
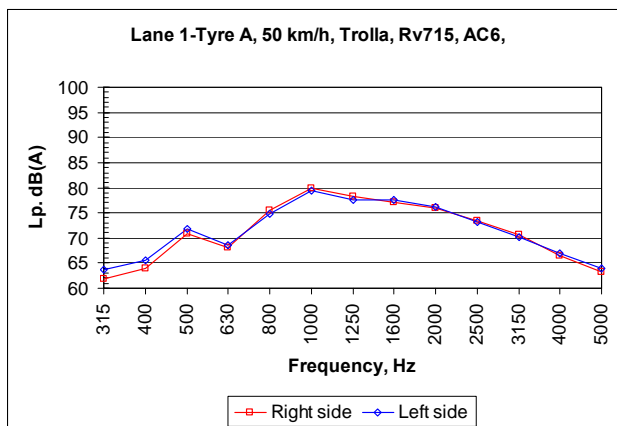
**Appendix 2. CPX: Individual measurement results from test pavements**

**Pavement 1: AC6 - Rv715, Trolla, lane 1, 50 km/h**

**2005:**

Location	Trolla, Rv715
Road surface type	AC6
Test section length	260
Direction	Lane 1 Hp1 5.890-6.140
Date	01092005
Air temperature	15
Road temperature	11

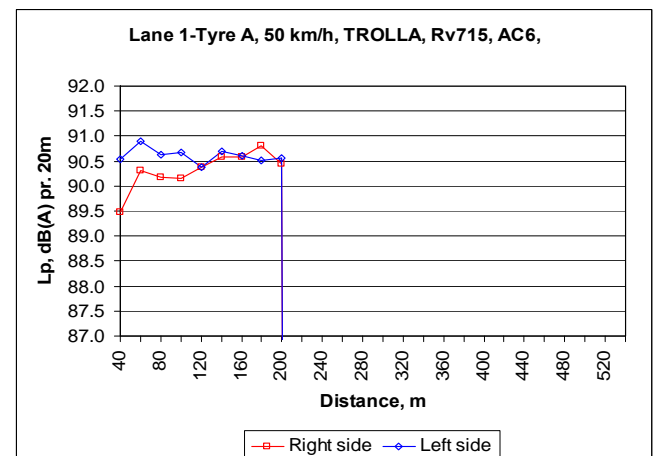
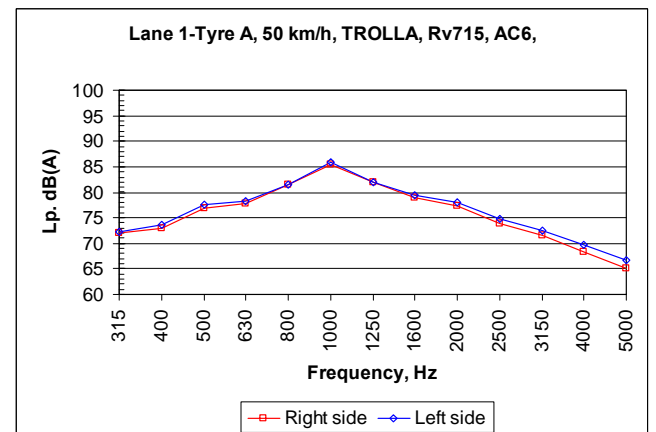
Lane 1-Tyre A, 50 km/h, Trolla, Rv715, AC6,			
Total-average speed for dist. 0 - 260 m		50.5 km/h	
Std.dev.		0.78	
dBA / Distance	Air temp Right s	15 Left s	Temp.corr. to +20C Right side Left side
Total-average for dist. 0 - 260 m	85.9	85.7	85.6 85.4
Average for dist. 40 - 280 m			85.6 85.4
Std.dev.			0.52 0.54



**2006:**

Location	TROLLA, Rv715
Road surface type	AC6
Test section length	220
Direction	Lane 1
Date	21062006
Air temperature	22
Road temperature	22

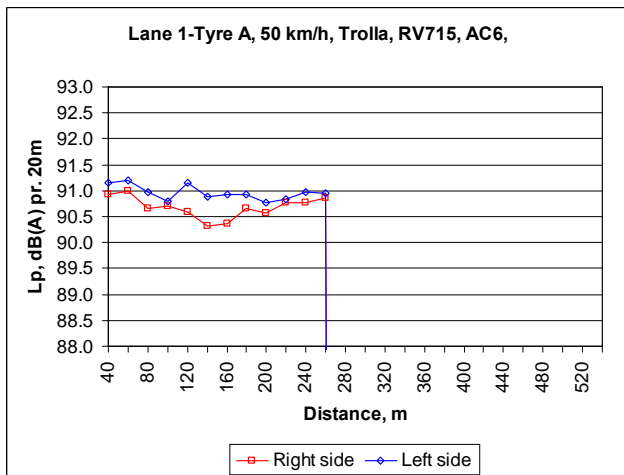
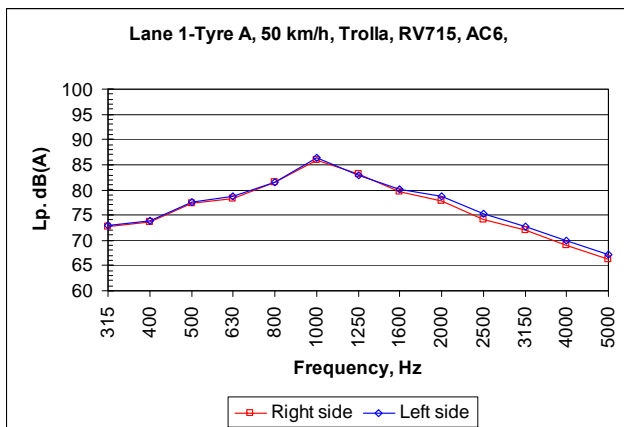
Lane 1-Tyre A, 50 km/h, TROLLA, Rv715, AC6,				
Total-average speed for dist. 0 - 200 m		50.5 km/h		
Std.dev.		0.69		
dBA / Distance	Air temp Right s	22 Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 200 m	90.1	90.5	90.2	90.6
Average for dist. 40 - 220 m			90.3	90.6
Std.dev.			0.38	0.15



**2007:**

Location	Trolla, RV715
Road surface type	AC6
Test section length	260
Direction	Lane 1
Date	02.07.2007
Air temperature	25
Road temperature	22

Lane 1-Tyre A, 50 km/h, Trolla, RV715, AC6,				
Total-average speed for dist. 0 - 260 m		50.5 km/h		
Std.dev.		0.85		
dBA / Distance	Air temp Right s	25 Left s	Temp.corr. to +20C Right side Left side	
<k for dist. 0 - 260 m				
	90.3	90.6	90.6	90.9
Average	for dist. 40 - 280 m		90.7	91.0
Std.dev.			0.21	0.14

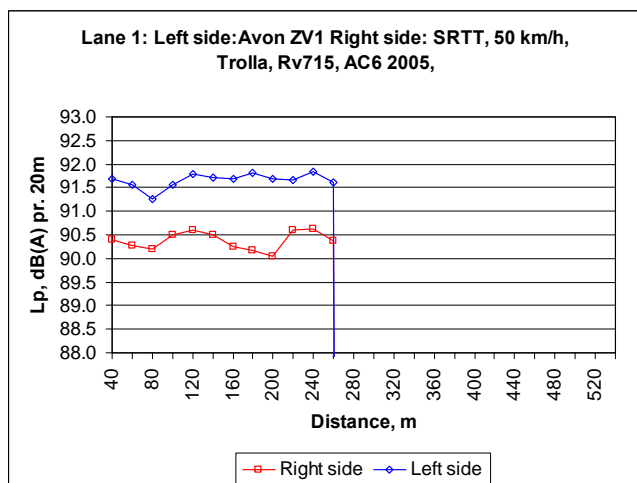
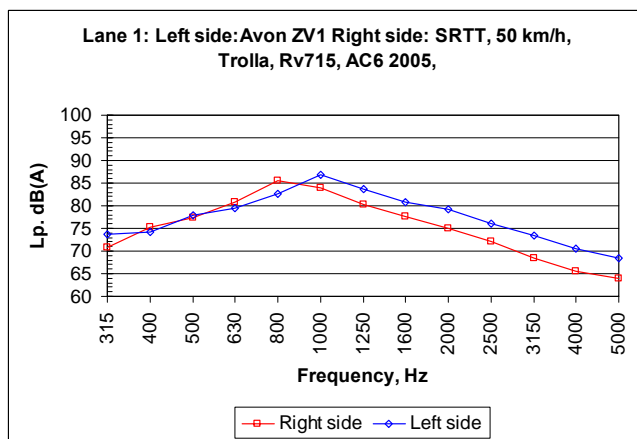


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Trolla, Rv715
Road surface type	AC6 2005
Test section length	260
Direction	Lane 1
Date	29.05.2008
Air temperature	19
Road temperature	25

Lane 1: Left side:Avon ZV1 Right side: SRTT, 50 km/h, Trolla, Rv715, AC6				
Total-average speed for dist. 0 - 260 m		50.7 km/h		
Std.dev.		0.57		
dBA / Distance	Air temp Right s	19 Left s	Temp.corr. to +20C Right side Left side	
Total-average for dist. 0 - 260 m				
	90.5	91.7	90.4	91.7
Average	for dist. 40 - 160 m		90.4	91.6
Std.dev.			0.15	0.18

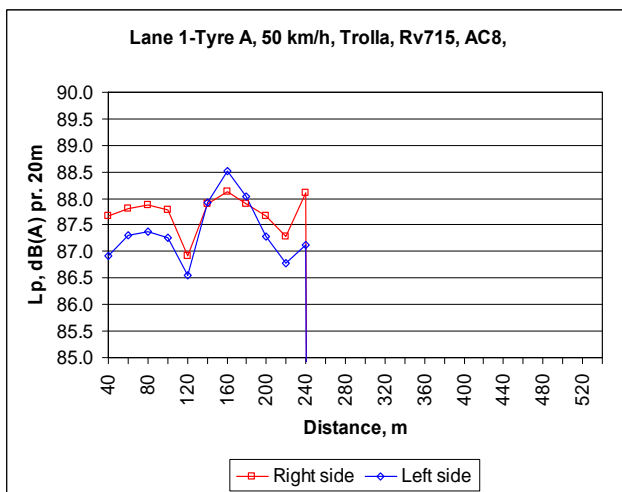
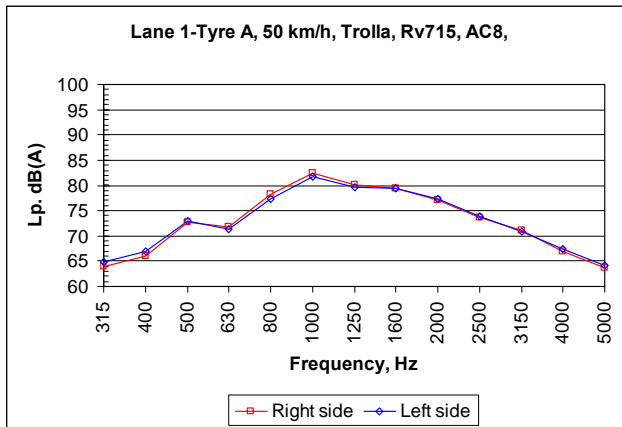


**Pavement 2: AC8 - Rv715, Trolla, lane 1, 50 km/h**

**2005:**

Location	Trolla, Rv715
Road surface type	AC8
Test section length	250
Direction	Lane 1 Hp1 4.890-5.140
Date	01092005
Air temperature	15
Road temperature	11

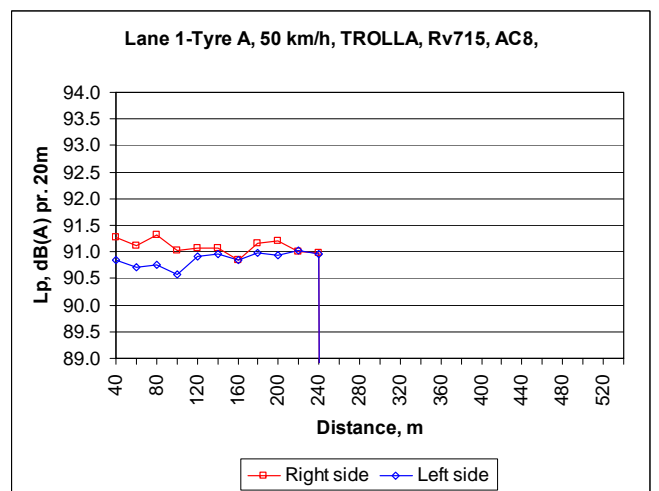
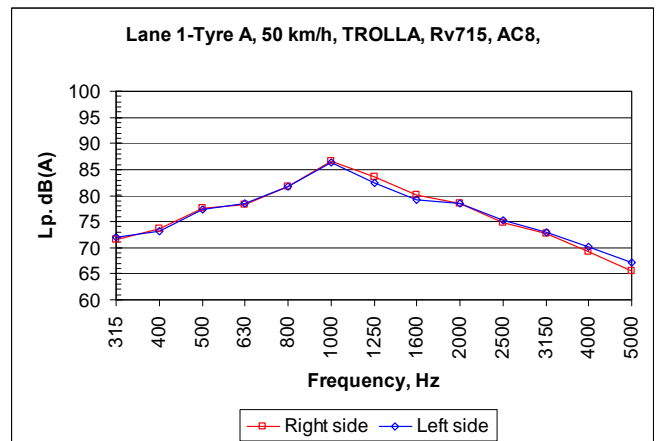
Lane 1-Tyre A, 50 km/h, Trolla, Rv715, AC8,				
Total-average speed for dist. 0 - 240 m		50.3 km/h		
Std.dev.		0.69		
dBA / Distance	Air temp	15	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 240 m				
	88.1	87.7	87.8	87.4
Average for dist. 40 - 260 m				
			87.7	87.4
Std.dev.				
			0.35	0.58



**2006:**

Location	TROLLA, Rv715
Road surface type	AC8
Test section length	240
Direction	Lane 1
Date	21062006
Air temperature	22
Road temperature	22

Lane 1-Tyre A, 50 km/h, TROLLA, Rv715, AC8,				
Total-average speed for dist. 0 - 240 m		50.7 km/h		
Std.dev.		0.67		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 240 m				
	91.0	90.8	91.1	90.9
Average for dist. 40 - 260 m				
			91.1	90.9
Std.dev.				
			0.14	0.14

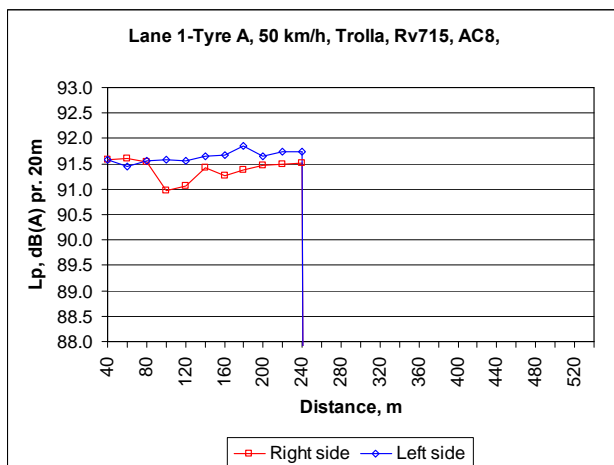
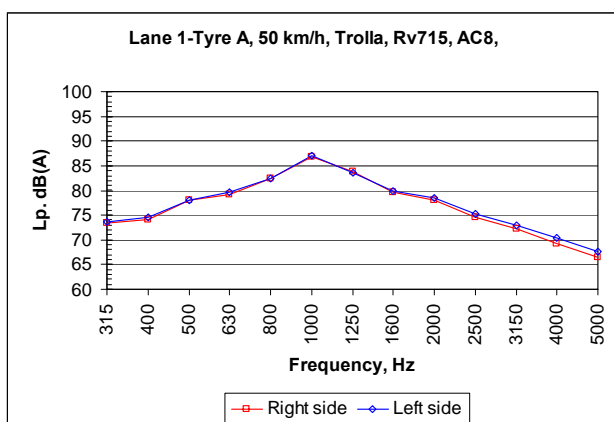




**2007:**

Location	Trolla, Rv715
Road surface type	AC8
Test section length	240
Direction	Lane 1
Date	02.07.2007
Air temperature	25
Road temperature	22

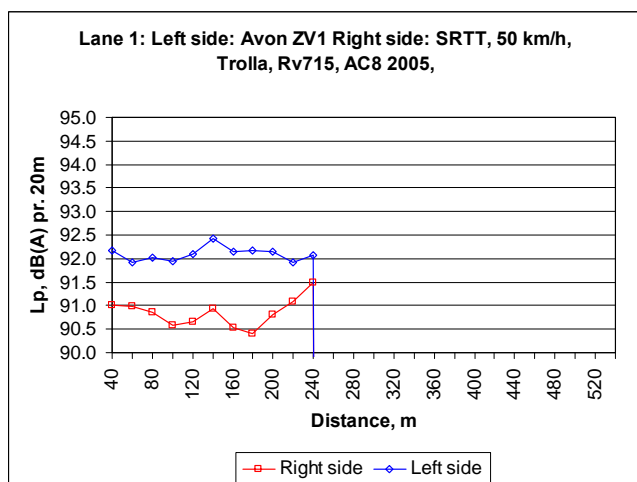
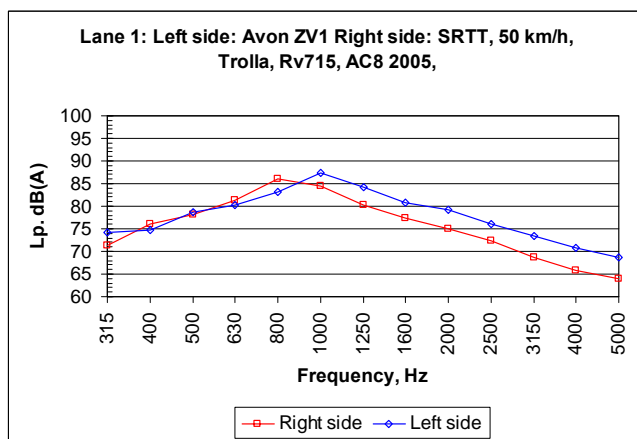
Lane 1-Tyre A, 50 km/h, Trolla, Rv715, AC8,				
Total-average speed for dist. 0 - 240 m		49.6 km/h		
Std.dev.		0.69		
dBA / Distance	Air temp 25	Temp.corr. to +20C		
	Right s	Left s	Right side	Left side
<k for dist. 0 - 240 m				
	91.1	91.3	91.4	91.6
Average for dist. 40 - 260 m				
			91.4	91.6
Std.dev.				
			0.21	0.11


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Trolla, Rv715
Road surface type	AC8 2005
Test section length	240
Direction	Lane 1
Date	29.05.2008
Air temperature	19
Road temperature	25

Lane 1: Left side: Avon ZV1 Right side: SRTT, 50 km/h, Trolla, Rv715, AC8,				
Total-average speed for dist. 0 - 240 m		49.4 km/h		
Std.dev.		0.59		
dBA / Distance	Air temp 19	Temp.corr. to +20C		
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 240 m				
	90.9	92.2	90.9	92.1
Average for dist. 40 - 260 m				
			90.9	92.1
Std.dev.				
			0.30	0.15

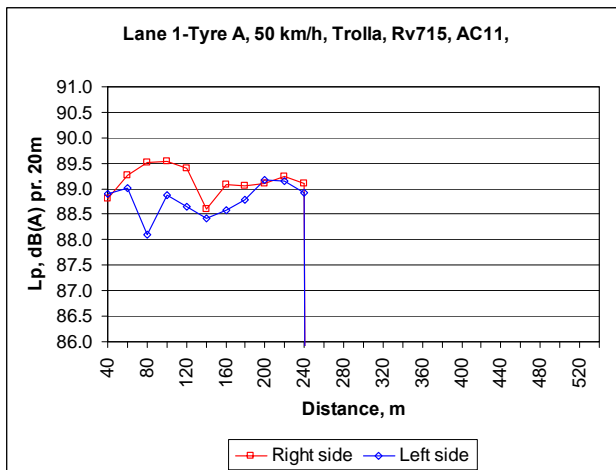
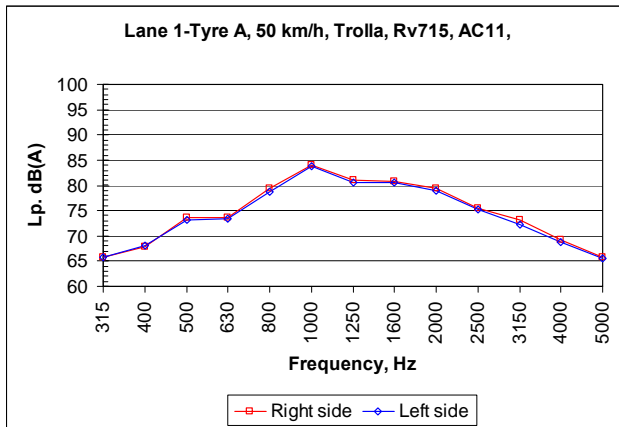


### Pavement 3: AC11 - Rv715, Trolla, lane 1, 50 km/h

**2005:**

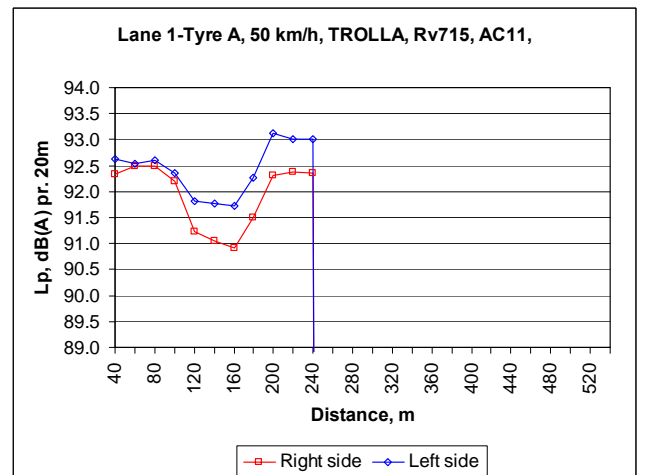
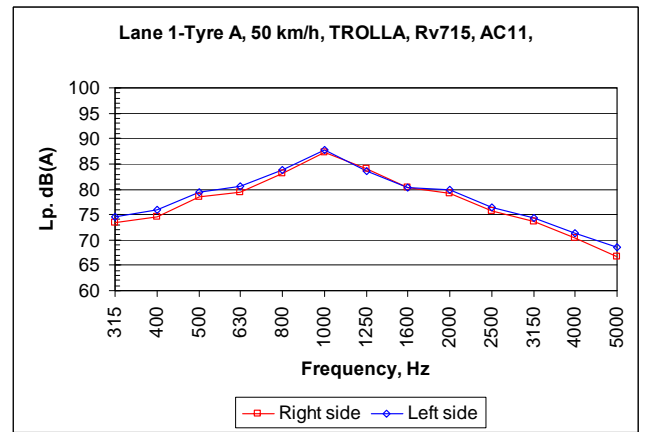
Location	Trolla, Rv715
Road surface type	AC11
Test section length	250
Direction	Lane 1 Hp1 5.390-5.640
Date	01092005
Air temperature	15
Road temperature	11

Lane 1-Tyre A, 50 km/h, Trolla, Rv715, AC11,				
Total-average speed for dist. 0 - 240 m		49.9 km/h		
Std.dev.		0.65		
dBA / Distance	Air temp	15	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 240 m			89.2	88.8
Average for dist. 40 - 260 m			89.2	88.8
Std.dev.			0.28	0.32


**2006:**

Location	TROLLA, Rv715
Road surface type	AC11
Test section length	240
Direction	Lane 1
Date	21062006
Air temperature	22
Road temperature	22

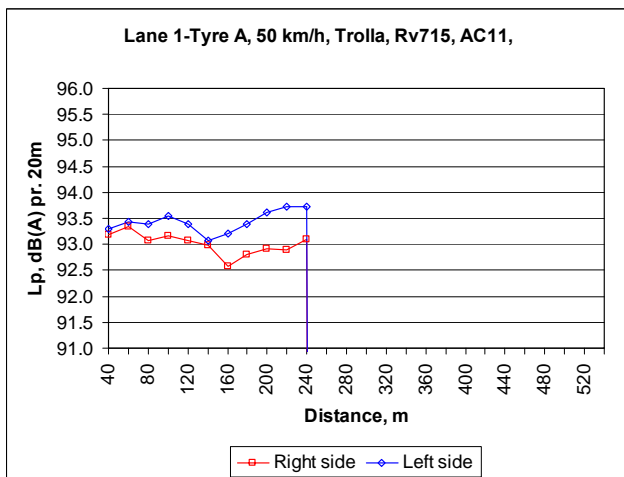
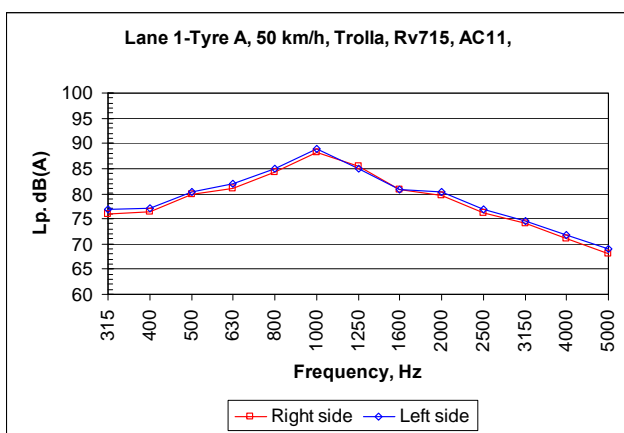
Lane 1-Tyre A, 50 km/h, TROLLA, Rv715, AC11,				
Total-average speed for dist. 0 - 240 m		49.9 km/h		
Std.dev.		0.59		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 240 m			92.0	92.5
Average for dist. 40 - 260 m			91.9	92.4
Std.dev.			0.62	0.51



**2007:**

Location	Trolla, Rv715
Road surface type	AC11
Test section length	240
Direction	Lane 1
Date	02.07.2007
Air temperature	25
Road temperature	22

Lane 1-Tyre A, 50 km/h, Trolla, Rv715, AC11,				
Total-average speed for dist. 0 - 240 m		50.0 km/h		
Std.dev.		0.50		
dBA / Distance	Air temp	25	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 240 m				
	92.7	93.1	93.0	93.4
Average for dist. 40 - 260 m				
			93.0	93.4
Std.dev.				
			0.21	0.21

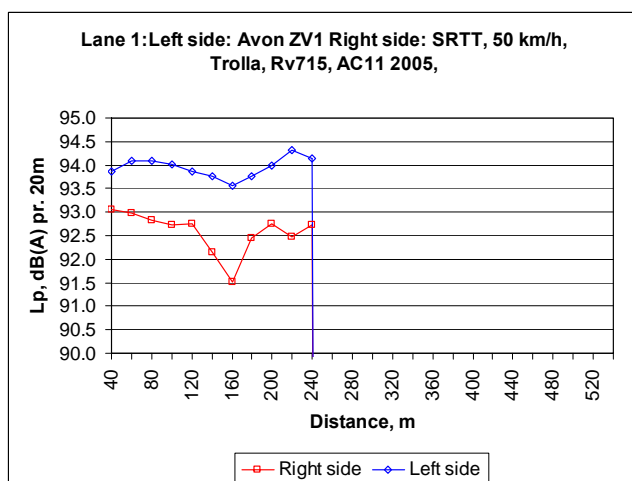
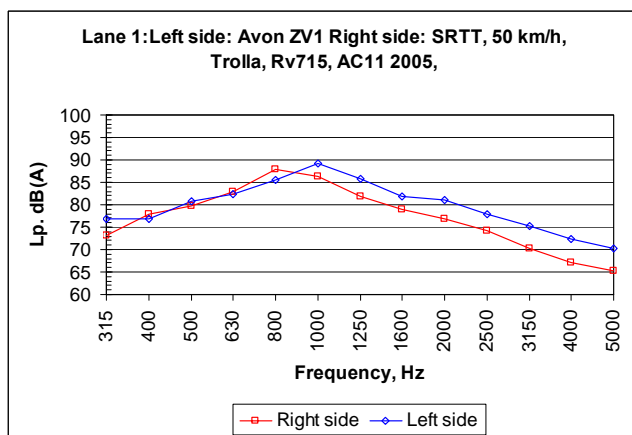


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Trolla, Rv715
Road surface type	AC11 2005
Test section length	240
Direction	Lane 1
Date	29.05.2008
Air temperature	19
Road temperature	25

Lane 1:Left side: Avon ZV1 Right side: SRTT, 50 km/h, Trolla, Rv715, AC11 2005,				
Total-average speed for dist. 0 - 240 m		49.7 km/h		
Std.dev.		0.79		
dBA / Distance	Air temp	19	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 240 m				
	92.6	94.0	92.6	93.9
Average for dist. 40 - 260 m				
			92.6	93.9
Std.dev.				
			0.44	0.21

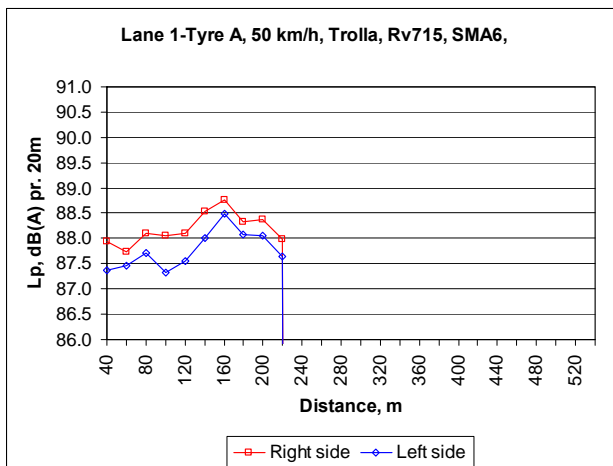
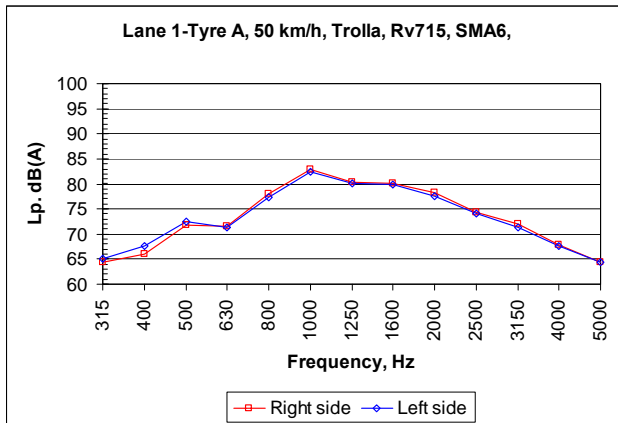


**Pavement 4: SMA6- Rv715, Trolla, lane 1, 50 km/h**

**2005:**

Location	Trolla, Rv715
Road surface type	SMA6
Test section length	240
Direction	Lane1 Hp1 6.140-6.382
Date	01092005
Air temperature	15
Road temperature	11

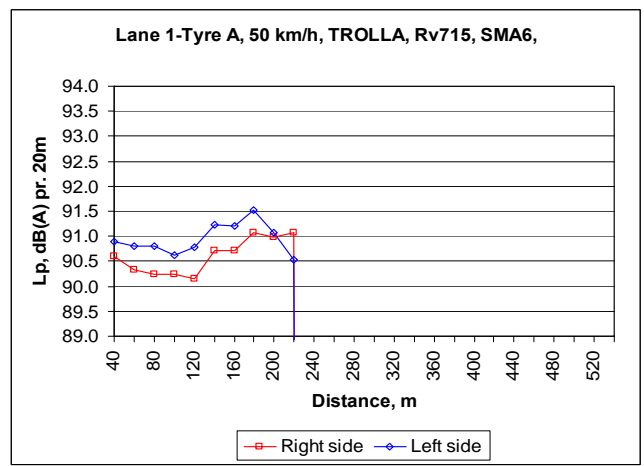
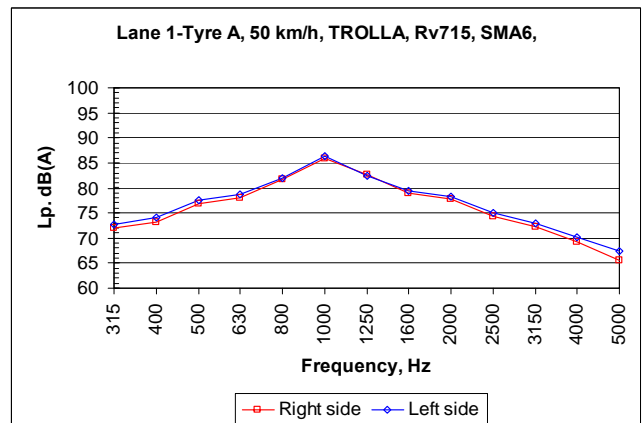
Lane 1-Tyre A, 50 km/h, Trolla, Rv715, SMA6,				
Total-average speed for dist. 0 - 220 m		49.9 km/h		
Std.dev.		0.33		
dBA / Distance	Air temp	15	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 220 m				
88.3		88.0		
Average for dist. 40 - 240 m		88.2		
Std.dev.		0.31		



**2006:**

Location	TROLLA, Rv715
Road surface type	SMA6
Test section length	220
Direction	Lane 1
Date	21062006
Air temperature	22
Road temperature	22

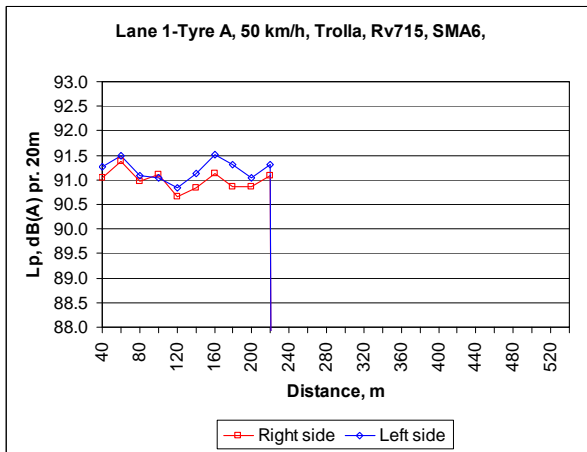
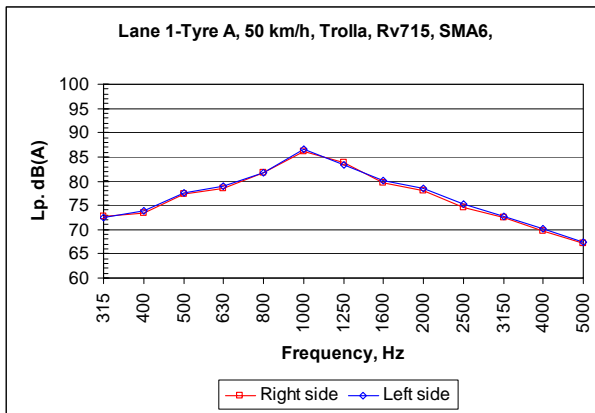
Lane 1-Tyre A, 50 km/h, TROLLA, Rv715, SMA6,				
Total-average speed for dist. 0 - 220 m		48.8 km/h		
Std.dev.		1.35		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 220 m				
90.5		90.8		
Average for dist. 40 - 240 m		90.6		
Std.dev.		0.36		



**2007:**

Location	Trolla, Rv715
Road surface type	SMA6
Test section length	220
Direction	Lane 1
Date	02.07.2007
Air temperature	25
Road temperature	22

Lane 1-Tyre A, 50 km/h, Trolla, Rv715, SMA6,				
Total-average speed for dist. 0 - 220 m		49.7 km/h		
Std.dev.		0.37		
dBA / Distance	Air temp 25	Temp.corr. to +20C		
	Right s	Left s	Right side	Left side
<k for dist. 0 - 220 m				
	90.7	90.9	91.0	91.2
Average for dist. 40 - 240 m				
Std.dev.			0.20	0.22

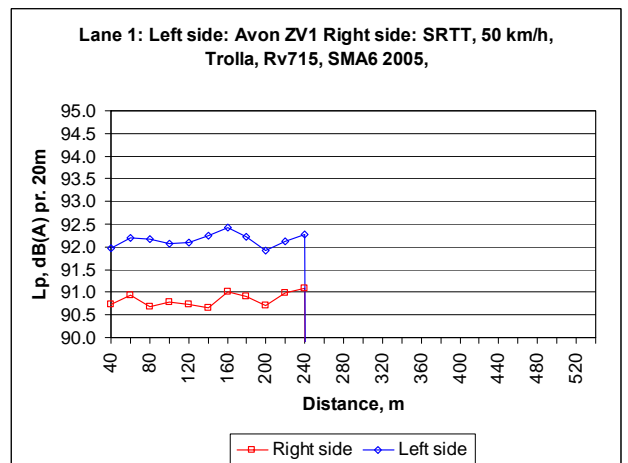
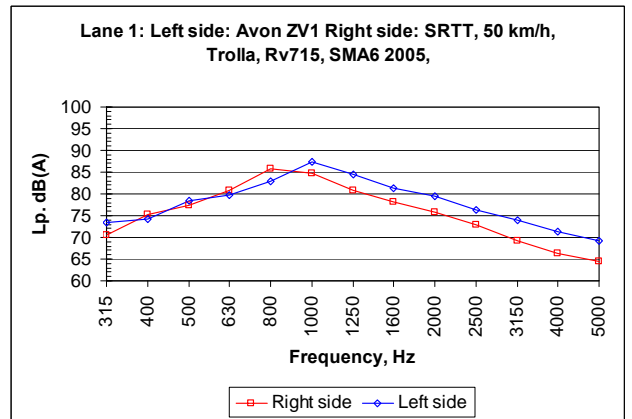


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Trolla, Rv715
Road surface type	SMA6 2005
Test section length	240
Direction	Lane 1
Date	29.05.2008
Air temperature	19
Road temperature	25

Lane 1: Left side: Avon ZV1 Right side: SRTT, 50 km/h, Trolla, Rv715,				
Total-average speed for dist. 0 - 240 m		49.7 km/h		
Std.dev.		0.57		
dBA / Distance	Air temp 19	Temp.corr. to +20C		
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 240 m				
	90.9	92.2	90.8	92.1
Average for dist. 40 - 260 m				
Std.dev.			0.15	0.14

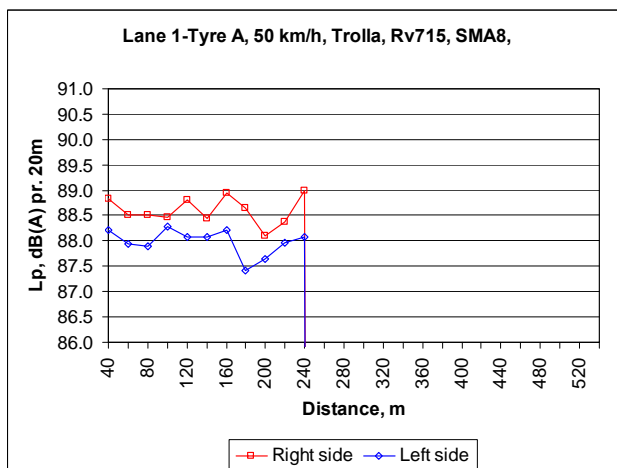
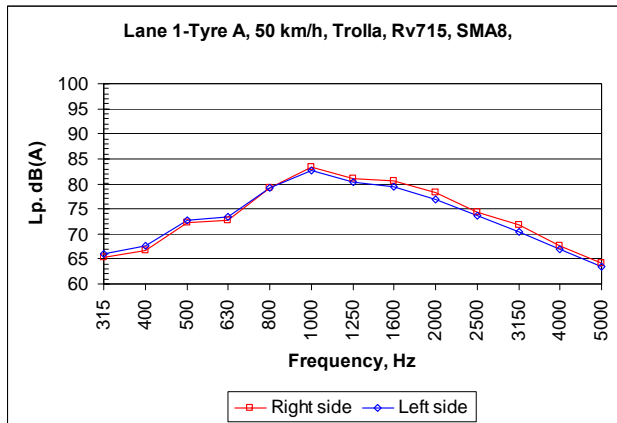


**Pavement 5: SMA8 - Rv715, Trola, lane 1, 50 km/h**

**2005:**

Location	Trola, Rv715		
Road surface type	SMA8		
Test section length	250		
Direction	Lane 1 Hp1 5.140-5.390		
Date	01092005		
Air temperature		15	
Road temperature		11	

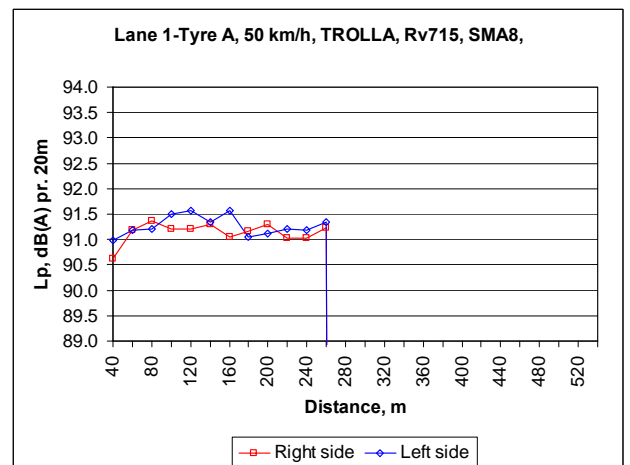
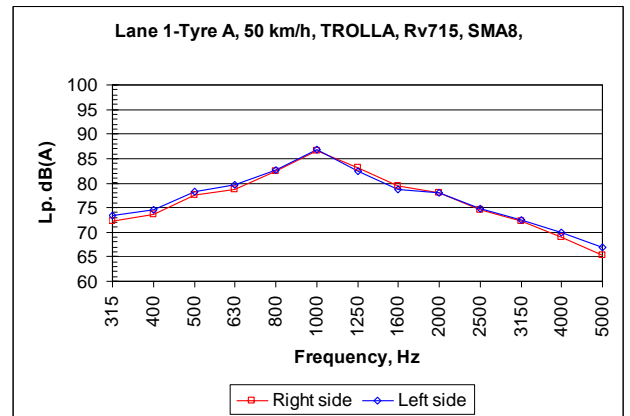
Lane 1-Tyre A, 50 km/h, Trola, Rv715, SMA8,				
Total-average speed for dist. 0 - 240 m		50.7		km/h
Std.dev.		0.30		
dB(A) / Distance	Air temp	15	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 240 m		89.0		88.3
Average for dist. 40 - 260 m		88.6		88.0
Std.dev.		0.27		0.26



**2006:**

Location	TROLLA, Rv715		
Road surface type	SMA8		
Test section length	260		
Direction	Lane 1		
Date	21062006		
Air temperature		22	
Road temperature		22	

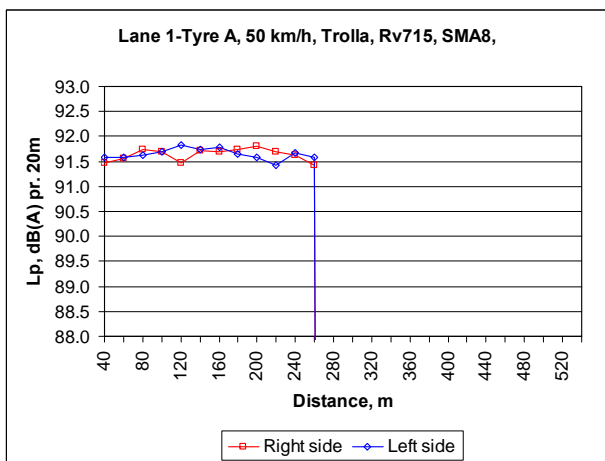
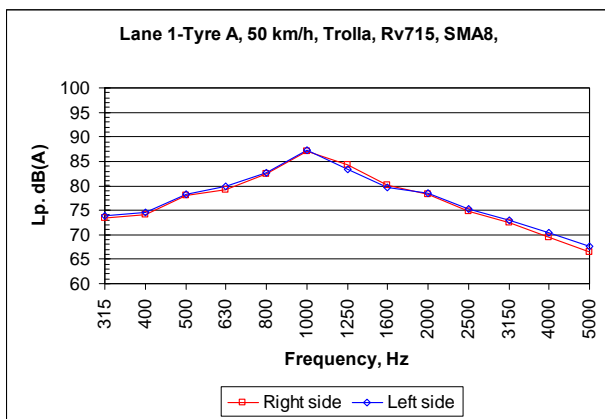
Lane 1-Tyre A, 50 km/h, TROLLA, Rv715, SMA8,				
Total-average speed for dist. 0 - 260 m		50.7		km/h
Std.dev.		0.43		
dB(A) / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 260 m		90.9		91.1
Average for dist. 40 - 280 m		91.1		91.3
Std.dev.		0.19		0.19



2007:

Location	Trolla, Rv715
Road surface type	SMA8
Test section length	260
Direction	Lane 1
Date	02.07.2007
Air temperature	25
Road temperature	22

Lane 1-Tyre A, 50 km/h, Trolla, Rv715, SMA8,				
Total-average speed for dist. 0 - 260 m		50.5 km/h		
Std.dev.		0.82		
dBA / Distance	Air temp	25	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 260 m				
	91.3	91.3	91.6	91.6
Average for dist. 40 - 280 m				
			91.6	91.6
Std.dev.				
			0.13	0.11

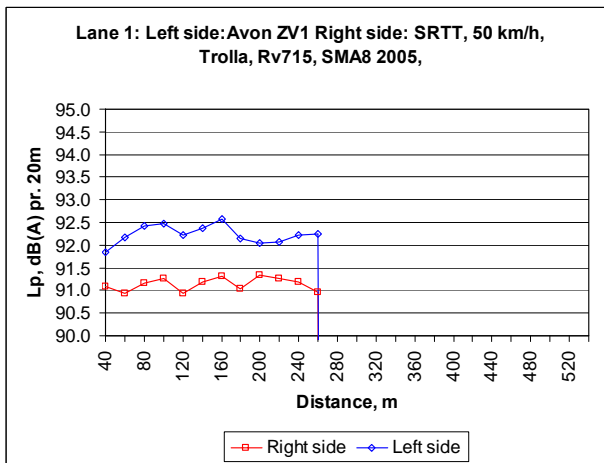
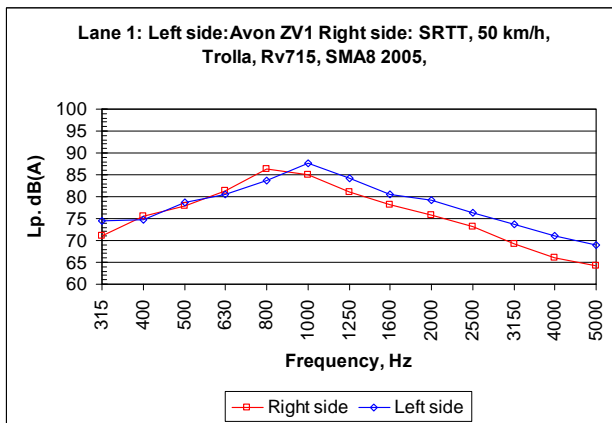


2008:

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Trolla, Rv715
Road surface type	SMA8 2005
Test section length	260
Direction	Lane 1
Date	29.05.2008
Air temperature	19
Road temperature	25

Lane 1: Left side:Avon ZV1 Right side: SRTT, 50 km/h, Trolla, Rv715, SMA8 2005,				
Total-average speed for dist. 0 - 260 m		50.5 km/h		
Std.dev.		0.53		
dBA / Distance	Air temp	19	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 260 m				
	91.2	92.3	91.2	92.2
Average for dist. 40 - 280 m				
			91.1	92.2
Std.dev.				
			0.15	0.20

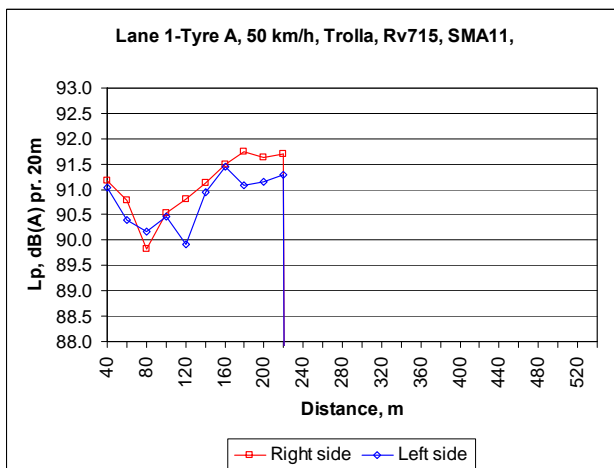
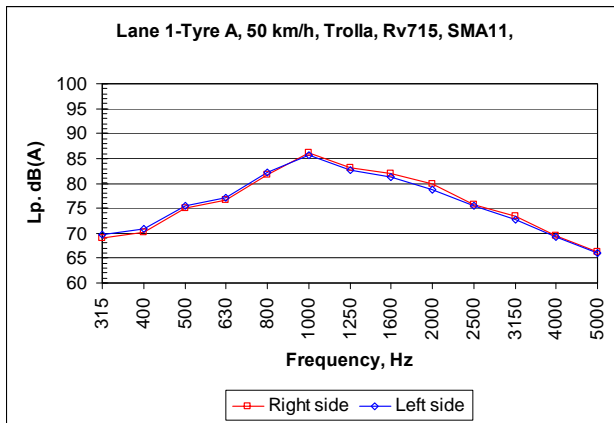


**Pavement 6: SMA11 - Rv715, Trolla, lane 1, 50 km/h**

**2005:**

Location	Trolla, Rv715
Road surface type	SMA11
Test section length	240
Direction	Lane 1 Hp1 5.640-5.890
Date	01092005
Air temperature	15
Road temperature	11

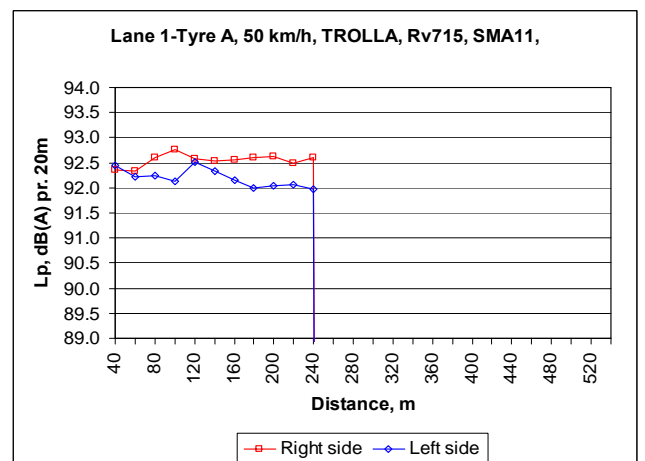
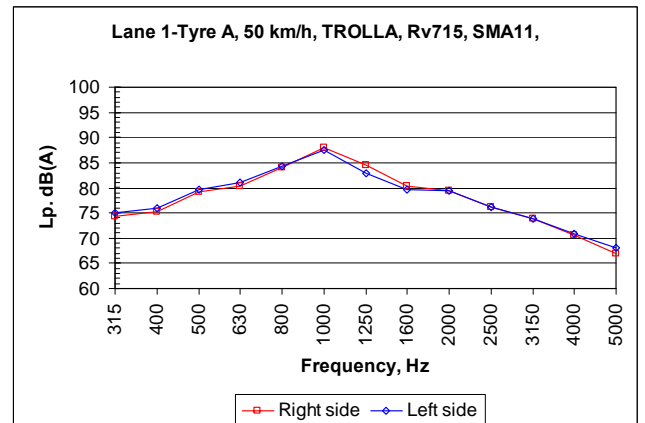
Lane 1-Tyre A, 50 km/h, Trolla, Rv715, SMA11,				
Total-average speed for dist. 0 - 220 m		51.8 km/h		
Std.dev.		0.49		
dBA / Distance	Air temp	15	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 220 m			91.0	90.6
Average for dist. 40 - 240 m			91.1	90.8
Std.dev.			0.61	0.52



**2006:**

Location	TROLLA, Rv715
Road surface type	SMA11
Test section length	240
Direction	Lane 1
Date	21062006
Air temperature	22
Road temperature	22

Lane 1-Tyre A, 50 km/h, TROLLA, Rv715, SMA11,				
Total-average speed for dist. 0 - 240 m		51.6 km/h		
Std.dev.		0.64		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 240 m			92.5	92.2
Average for dist. 40 - 260 m			92.6	92.2
Std.dev.			0.12	0.18

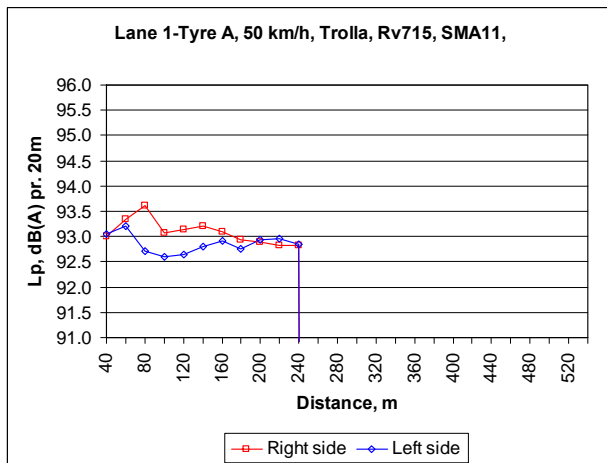
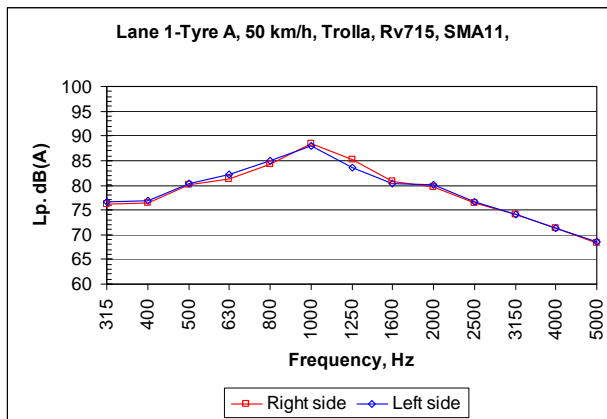




**2007:**

Location	Trolla, Rv715
Road surface type	SMA11
Test section length	240
Direction	Lane 1
Date	02.07.2007
Air temperature	25
Road temperature	22

Lane 1-Tyre A, 50 km/h, Trolla, Rv715, SMA11,				
Total-average speed for dist. 0 - 240 m		51.0 km/h		
Std.dev.		0.57		
dBA / Distance	Air temp	25	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
	<k for dist. 0 - 240 m			
	92.8	92.6	93.1	92.9
Average for dist. 40 - 260 m			93.1	92.9
Std.dev.			0.24	0.18

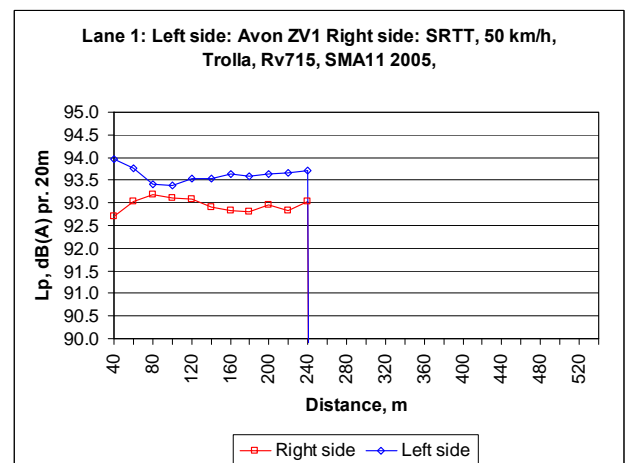
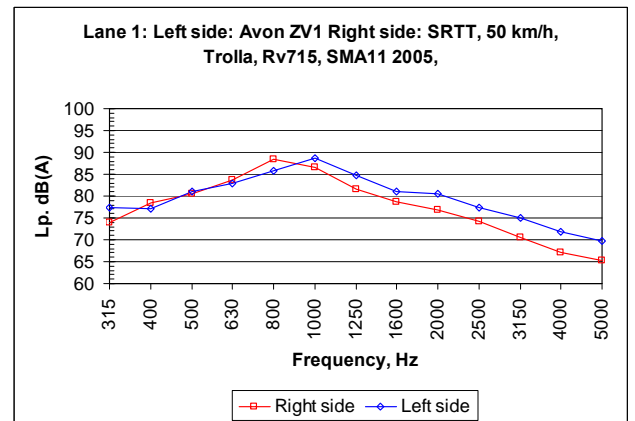


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Trolla, Rv715
Road surface type	SMA11 2005
Test section length	240
Direction	Lane 1
Date	29.05.2008
Air temperature	19
Road temperature	25

Lane 1: Left side: Avon ZV1 Right side: SRTT, 50 km/h, Trolla, Rv715,				
Total-average speed for dist. 0 - 240 m		51.4 km/h		
Std.dev.		0.59		
dBA / Distance	Air temp	19	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
	<k for dist. 0 - 240 m			
	93.0	93.8	92.9	93.7
Average for dist. 40 - 260 m			92.9	93.6
Std.dev.			0.15	0.16

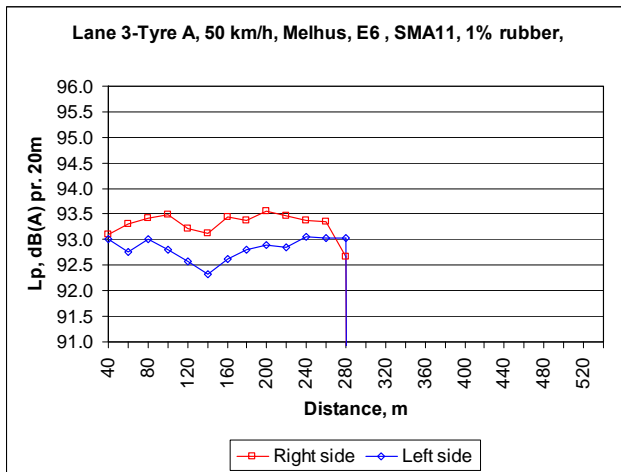
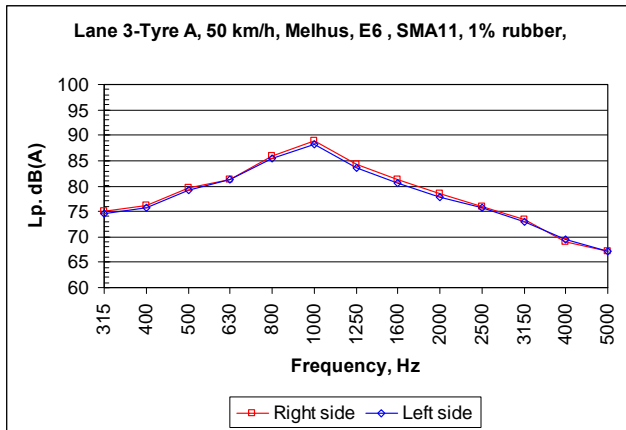


**Pavement 7: SMA11 1% rubber. E6-Melhus, lane 3, 50 km/h**

2005:

Location	Melhus, E6
Road surface type	SMA11, 1% rubber
Test section length	300
Direction	Lane 3
Date	08.12.2005
Air temperature	3
Road temperature	-3

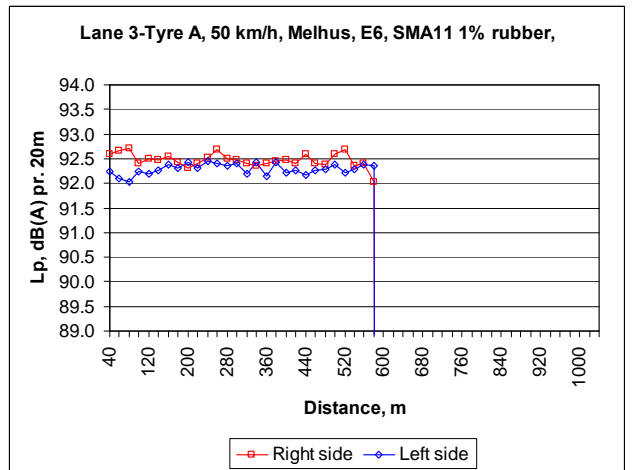
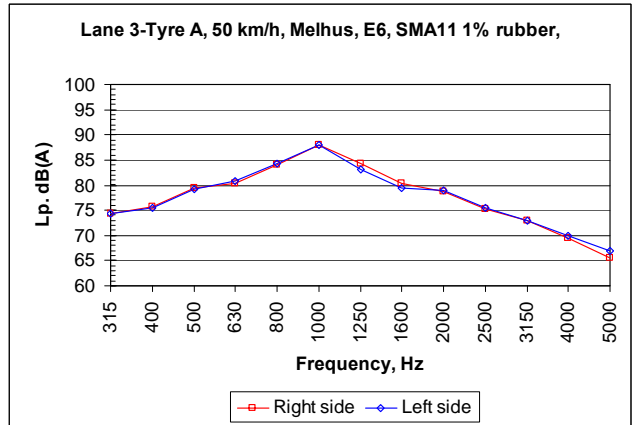
Lane 3-Tyre A, 50 km/h, Melhus, E6, SMA11, 1% rubber,				
Total-average speed for dist. 0 - 280 m		50.5 km/h		
Std.dev.		0.86		
dBA / Distance	Air temp	3	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 280 m				
	94.3	93.8	93.3	92.8
Average for dist. 40 - 300 m				
			93.3	92.8
Std.dev.				
			0.23	0.22



2006:

Location	Melhus, E6
Road surface type	SMA11 1% rubber
Test section length	580
Direction	Lane 3
Date	210606
Air temperature	23
Road temperature	30

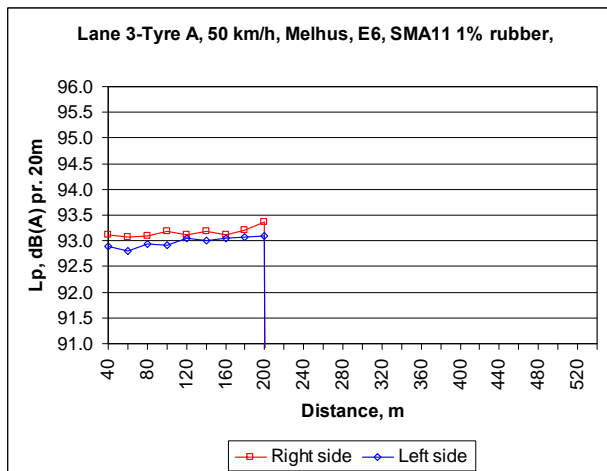
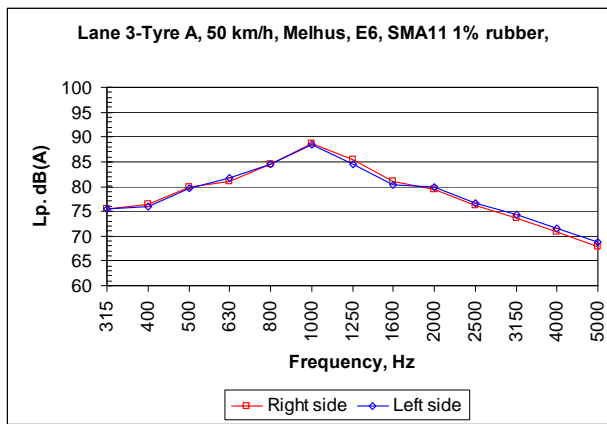
Lane 3-Tyre A, 50 km/h, Melhus, E6, SMA11 1% rubber,				
Total-average speed for dist. 0 - 580 m		51.1 km/h		
Std.dev.		0.52		
dBA / Distance	Air temp	23	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 580 m				
	92.3	92.1	92.5	92.3
Average for dist. 40 - 600 m				
			92.5	92.3
Std.dev.				
			0.14	0.11



2007:

Location	Melhus, E6
Road surface type	SMA11 1% rubber
Test section length	200
Direction	Lane 3
Date	03.07.2007
Air temperature	23
Road temperature	28

Lane 3-Tyre A, 50 km/h, Melhus, E6, SMA11 1% rubber,				
Total-average speed for dist. 0 - 200 m		50.9 km/h		
Std.dev.		0.67		
dB(A) / Distance	Air temp Right s	23 Left s	Temp.corr. to +20C	
			Right side	Left side
<k for dist. 0 - 200 m				
	93.0	92.8	93.1	93.0
Average for dist. 40 - 220 m				
			93.2	93.0
Std.dev.				
			0.08	0.10

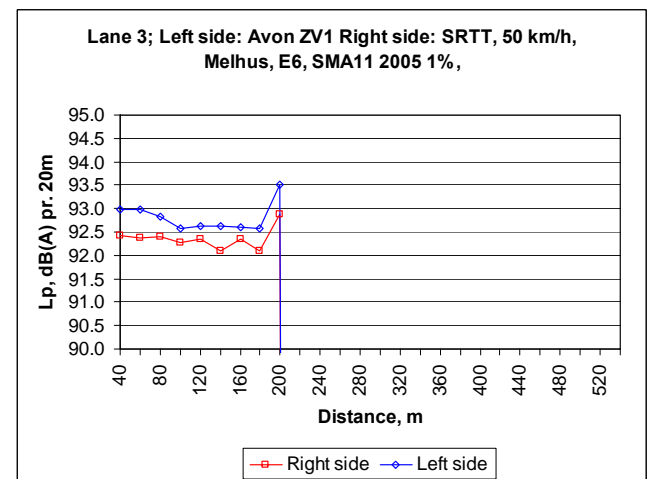
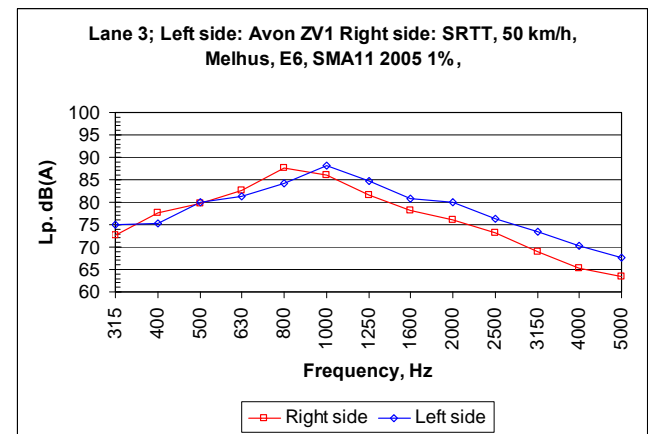


2008:

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Melhus, E6
Road surface type	SMA11 2005 1%
Test section length	200
Direction	Lane3
Date	29.05.2008
Air temperature	22
Road temperature	36

Lane 3; Left side: Avon ZV1 Right side: SRTT, 50 km/h, Melhus, E6, SMA11 2005 1%,				
Total-average speed for dist. 0 - 200 m		50.1 km/h		
Std.dev.		0.19		
dB(A) / Distance	Air temp Right s	22 Left s	Temp.corr. to +20C	
			Right side	Left side
Total-average for dist. 0 - 200 m				
	92.2	92.6	92.3	92.8
Average for dist. 40 - 220 m				
			92.4	92.8
Std.dev.				
			0.23	0.31

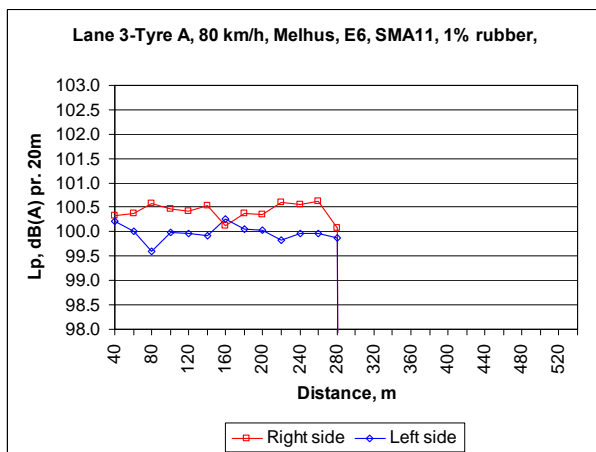
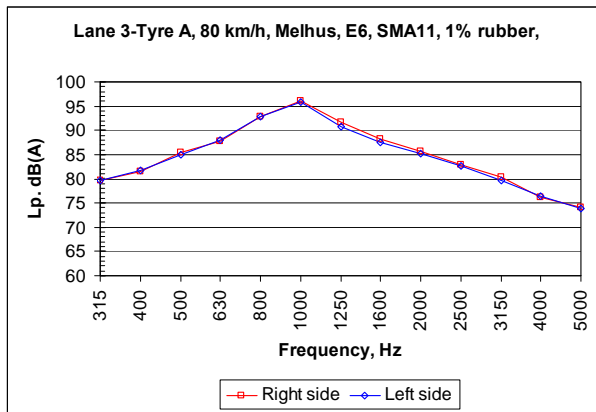


**Pavement 7: SMA11 1% rubber. E6-Melhus, lane 3, 80 km/h**

2005:

Location	Melhus, E6
Road surface type	SMA11, 1% rubber
Test section length	300
Direction	Lane 3
Date	08.12.2005
Air temperature	3
Road temperature	-3

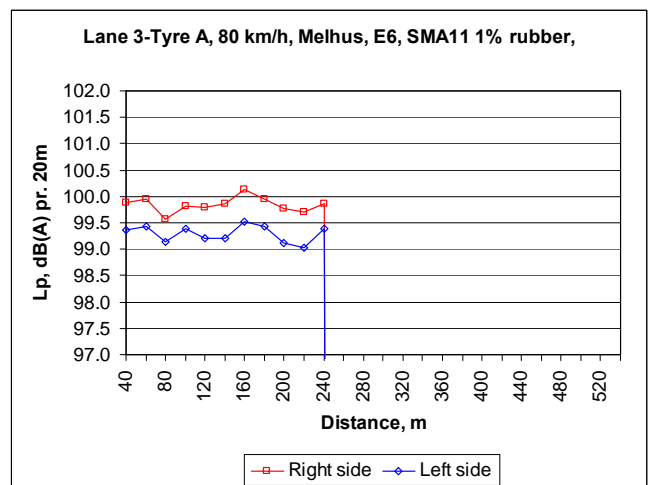
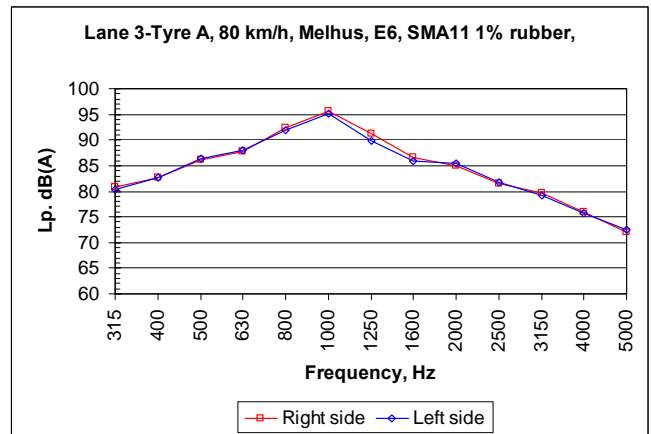
Lane 3-Tyre A, 80 km/h, Melhus, E6, SMA11, 1% rubber,				
Total-average speed for dist. 0 - 280 m		79.5		km/h
Std.dev.		0.31		
dBA / Distance	Air temp	3	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 280 m		101.4		101.0
Average for dist. 40 - 300 m		100.4		100.0
Std.dev.		0.17		0.16



2006:

Location	Melhus, E6
Road surface type	SMA11 1% rubber
Test section length	240
Direction	Lane 3
Date	210606
Air temperature	23
Road temperature	30

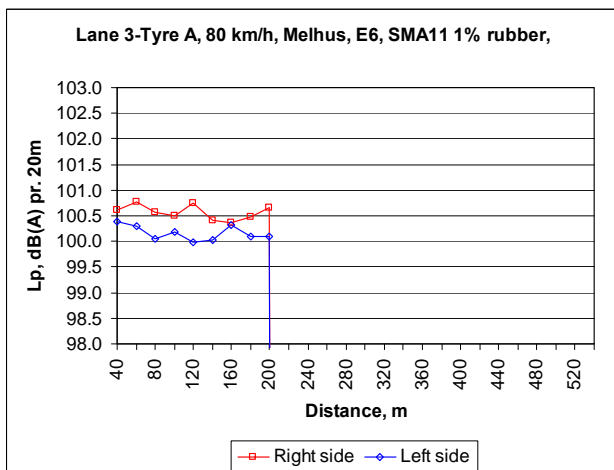
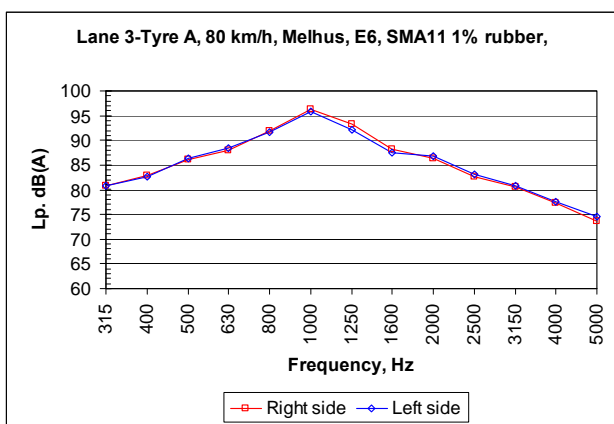
Lane 3-Tyre A, 80 km/h, Melhus, E6, SMA11 1% rubber,				
Total-average speed for dist. 0 - 240 m		80.0		km/h
Std.dev.		0.12		
dBA / Distance	Air temp	23	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 240 m		99.7		99.1
Average for dist. 40 - 260 m		99.8		99.3
Std.dev.		0.14		0.16



**2007:**

Location	Melhus, E6
Road surface type	SMA11 1% rubber
Test section length	200
Direction	Lane 3
Date	03.07.2007
Air temperature	23
Road temperature	28

Lane 3-Tyre A, 80 km/h, Melhus, E6, SMA11 1% rubber,				
Total-average speed for dist. 0 - 200 m		79.9 km/h		
Std.dev.		0.23		
dBA / Distance	Air temp	23	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 200 m				
	100.3	100.0	100.5	100.2
Average for dist. 40 - 220 m				
			100.6	100.2
Std.dev.				
			0.14	0.14

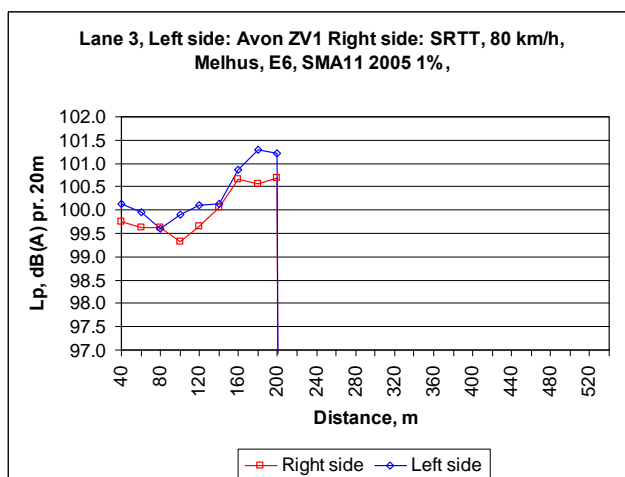
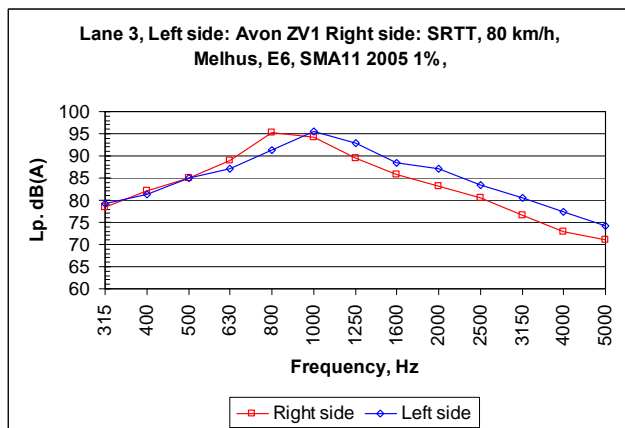


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Melhus, E6
Road surface type	SMA11 2005 1%
Test section length	200
Direction	Lane3
Date	29.05.2008
Air temperature	22
Road temperature	36

Lane 3, Left side: Avon ZV1 Right side: SRTT, 80 km/h, Melhus, E6, SMA11 2005 1%,				
Total-average speed for dist. 0 - 200 m		79.4 km/h		
Std.dev.		0.20		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 200 m				
	99.6	99.9	99.7	100.1
Average for dist. 40 - 220 m				
			100.0	100.4
Std.dev.				
			0.52	0.61

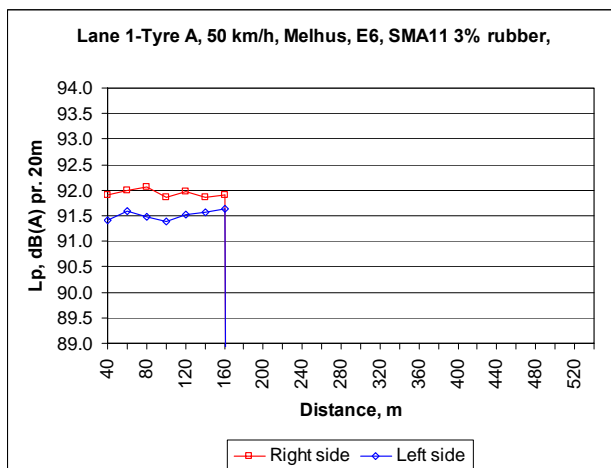
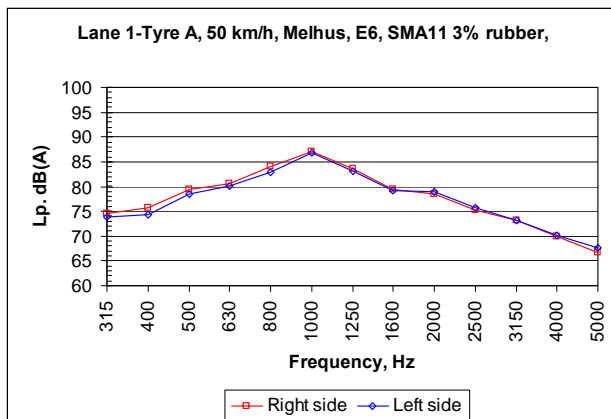


**Pavement 8: SMA11 3% rubber. E6-Melhus, lane 1, 50 km/h**

2007:

Location	Melhus, E6
Road surface type	SMA11 3% rubber
Test section length	160
Direction	Lane 1
Date	03.07.2007
Air temperature	23
Road temperature	28

Lane 1-Tyre A, 50 km/h, Melhus, E6, SMA11 3% rubber,				
Total-average speed for dist. 0 - 160 m		50.6 km/h		
Std.dev.		0.54		
dBA / Distance	Air temp Right s	Left s	Temp.corr. to +20C Right side	Left side
<k for dist. 0 - 160 m				
	91.7	91.3	91.9	91.4
Average for dist. 40 - 180 m			91.9	91.5
Std.dev.			0.08	0.10

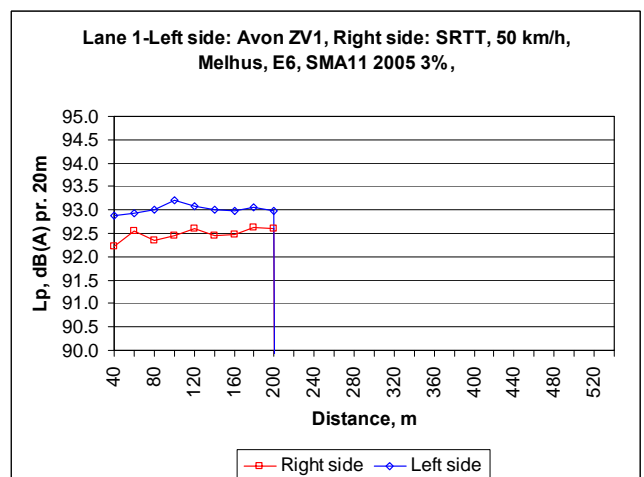
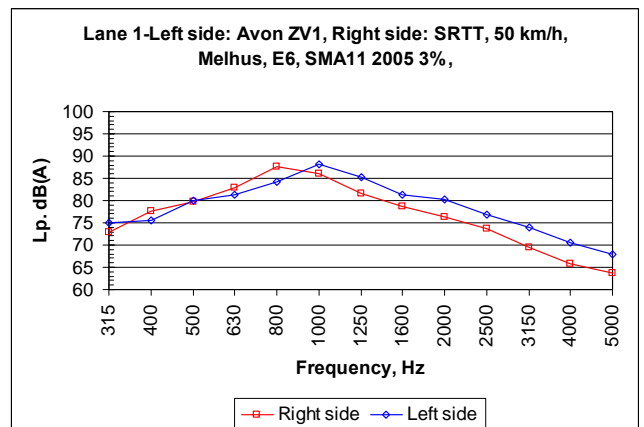


2008:

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Melhus, E6
Road surface type	SMA11 2005 3%
Test section length	200
Direction	Lane1
Date	29.05.2008
Air temperature	22
Road temperature	36

Lane 1-Left side: Avon ZV1, Right side: SRTT, 50 km/h, Melhus, E6, SMA11 2005 3%,				
Total-average speed for dist. 0 - 200 m		50.1 km/h		
Std.dev.		0.46		
dBA / Distance	Air temp Right s	Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 200 m				
	92.3	92.8	92.4	93.0
Average for dist. 40 - 220 m			92.5	93.0
Std.dev.			0.13	0.09

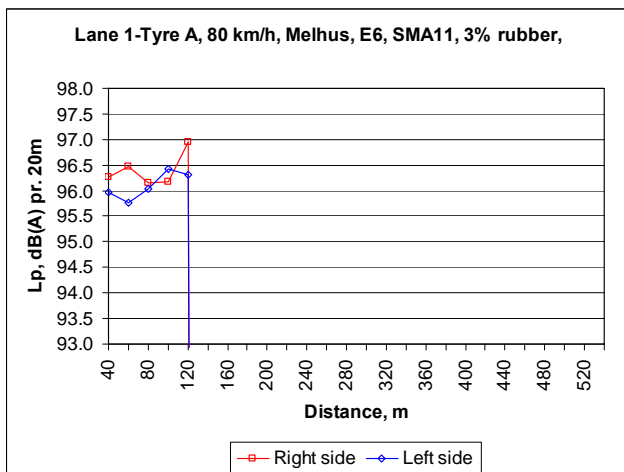
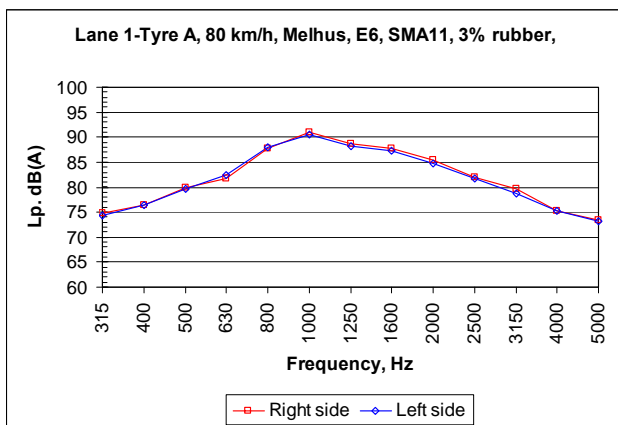


**Pavement 8: SMA11 3% rubber. E6-Melhus, lane 1, 80 km/h**

**2005:**

Location	Melhus, E6
Road surface type	SMA11, 3% rubber
Test section length	120
Direction	Lane 1
Date	08.12.2005
Air temperature	3
Road temperature	-3

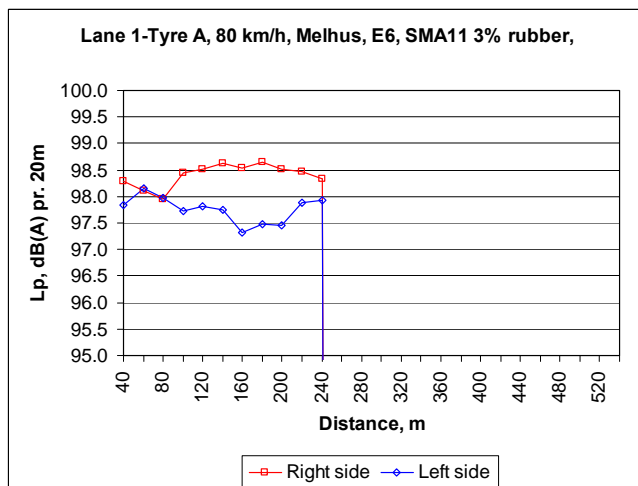
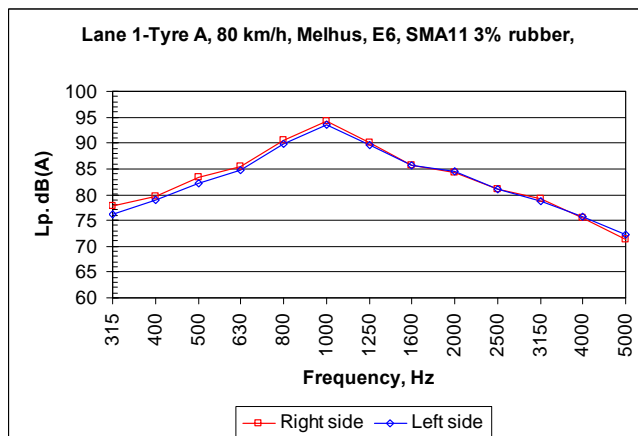
Lane 1-Tyre A, 80 km/h, Melhus, E6, SMA11, 3% rubber,				
Total-average speed for dist. 0 - 120 m		79.6 km/h		
Std.dev.		0.62		
dBA / Distance	Air temp Right s	Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 120 m	97.5	97.1	96.4	96.1
Average for dist. 40 - 140 m			96.4	96.1
Std.dev.			0.33	0.27



**2006:**

Location	Melhus, E6
Road surface type	SMA11 3% rubber
Test section length	240
Direction	Lane 1
Date	210606
Air temperature	23
Road temperature	30

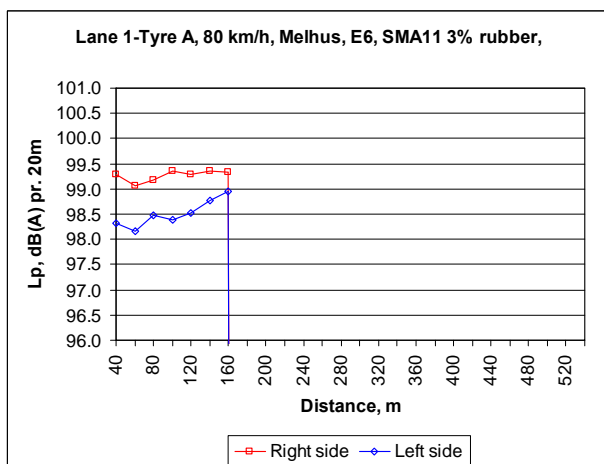
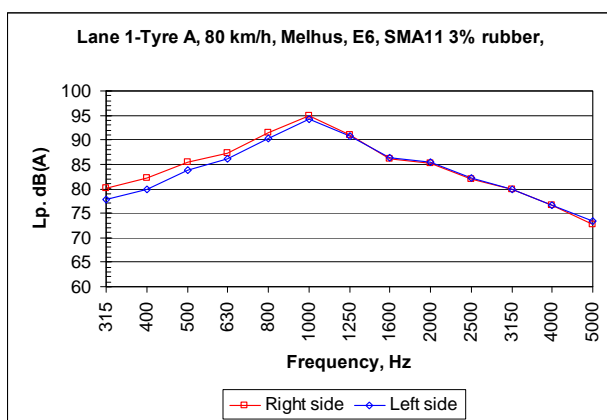
Lane 1-Tyre A, 80 km/h, Melhus, E6, SMA11 3% rubber,				
Total-average speed for dist. 0 - 240 m		80.0 km/h		
Std.dev.		0.32		
dBA / Distance	Air temp Right s	Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 240 m	98.2	97.5	98.3	97.7
Average for dist. 40 - 260 m			98.4	97.8
Std.dev.			0.22	0.25



**2007:**

Location	Melhus, E6
Road surface type	SMA11 3% rubber
Test section length	160
Direction	Lane 1
Date	03.07.2007
Air temperature	23
Road temperature	28

Lane 1-Tyre A, 80 km/h, Melhus, E6, SMA11 3% rubber,				
Total-average speed for dist. 0 - 160 m		78.5 km/h		
Std.dev.		0.23		
dBA / Distance	Air temp	23	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 160 m				
	99.0	98.4	99.2	98.6
Average	for dist. 40 - 180 m		99.3	98.5
Std.dev.			0.11	0.27

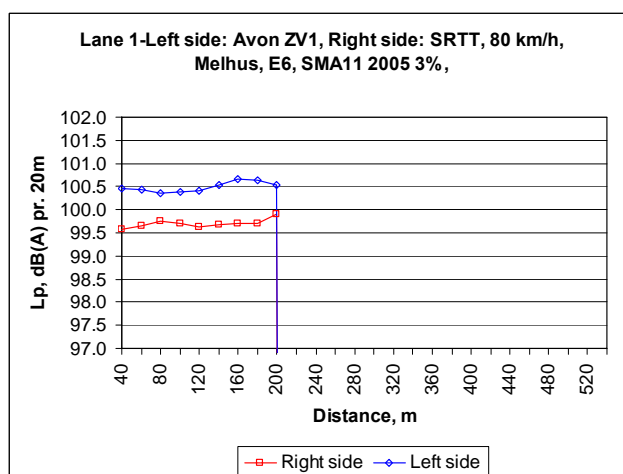
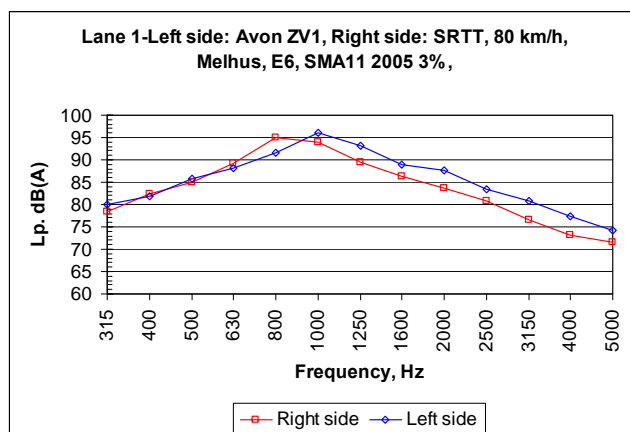


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Melhus, E6
Road surface type	SMA11 2005 3%
Test section length	200
Direction	Lane1
Date	29.05.2008
Air temperature	22
Road temperature	36

Lane 1-Left side: Avon ZV1, Right side: SRTT, 80 km/h, Melhus, E6, SMA11 2005 3%,				
Total-average speed for dist. 0 - 200 m		79.3 km/h		
Std.dev.		0.32		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 200 m				
	99.5	100.3	99.6	100.4
Average	for dist. 40 - 220 m		99.7	100.5
Std.dev.			0.09	0.11



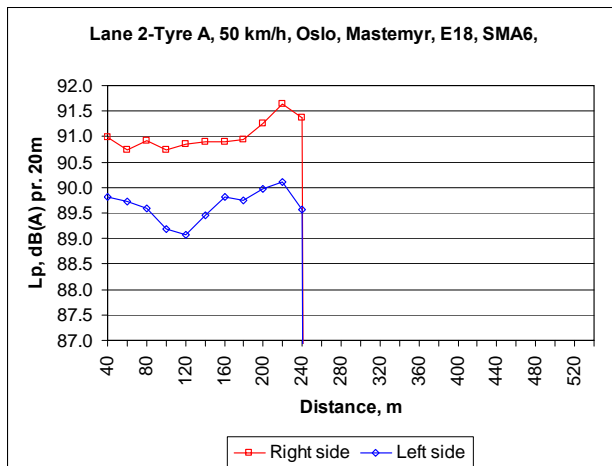
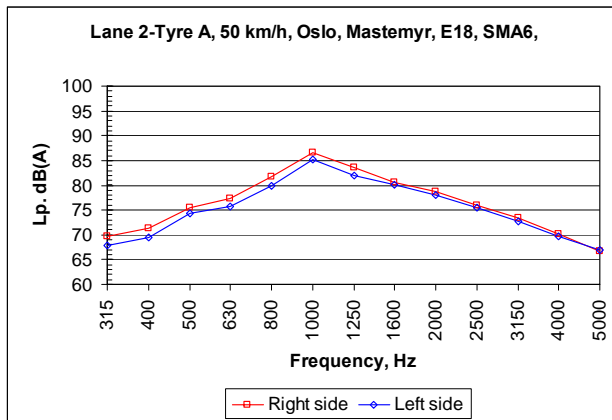


**Pavement 9: SMA6- E18 Mastemyr, lane 2, 50 km/h**

**2007:**

Location	Oslo, Mastemyr, E18
Road surface type	SMA6
Test section length	240
Direction	Lane 2
Date	26.06.2007
Air temperature	18
Road temperature	22

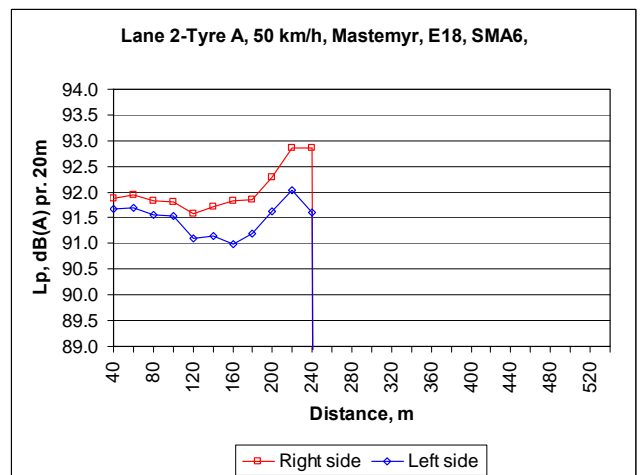
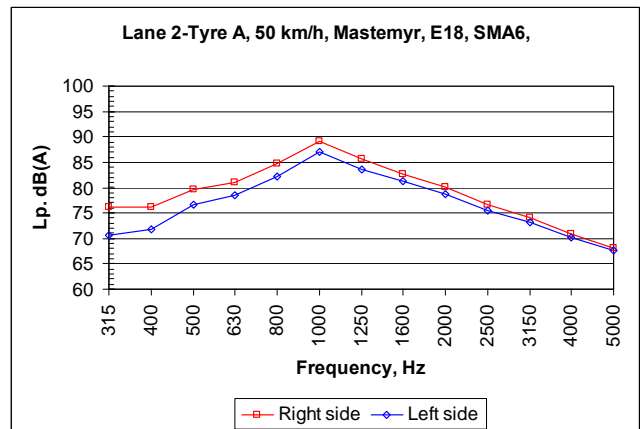
Lane 2-Tyre A, 50 km/h, Oslo, Mastemyr, E18, SMA6,				
Total-average speed for dist. 0 - 240 m		49.9 km/h		
Std.dev.		0.21		
dBA / Distance	Air temp Right s	Left s	Temp.corr. to +20C Right side	Left side
<k for dist. 0 - 240 m				
	91.1	89.8	91.0	89.7
Average for dist. 40 - 260 m		91.0 89.6		
Std.dev.		0.28 0.31		



**2008:**

Location	Mastemyr, E18
Road surface type	SMA6
Test section length	260
Direction	Lane 2
Date	26.06.2008
Air temperature	18
Road temperature	25

Lane 2-Tyre A, 50 km/h, Mastemyr, E18, SMA6,				
Total-average speed for dist. 0 - 240 m		51.9 km/h		
Std.dev.		0.48		
dBA / Distance	Air temp Right s	Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 240 m				
	92.1	91.6	92.0	91.5
Average for dist. 40 - 260 m		92.0 91.5		
Std.dev.		0.44 0.32		

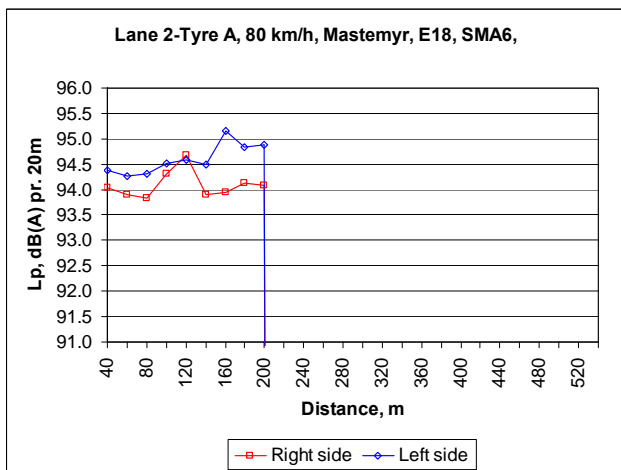
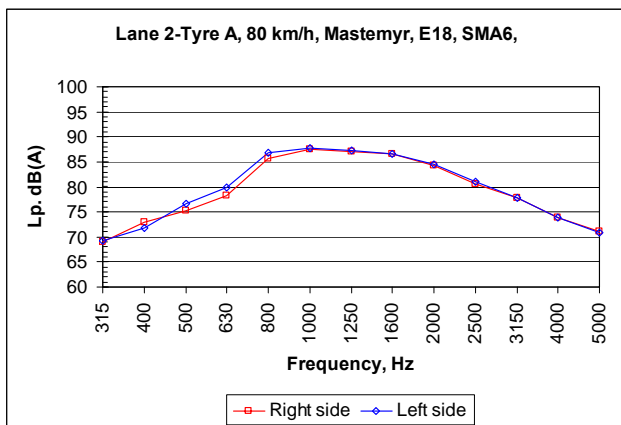


### Pavement 9: SMA6- E18 Mastemyr, lane 2, 80 km/h

**2005:**

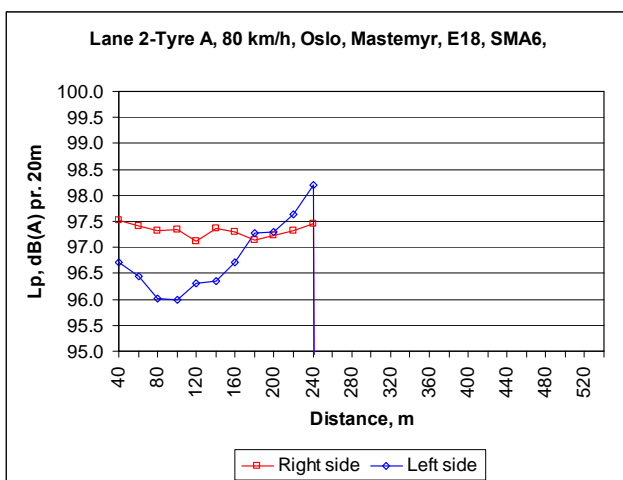
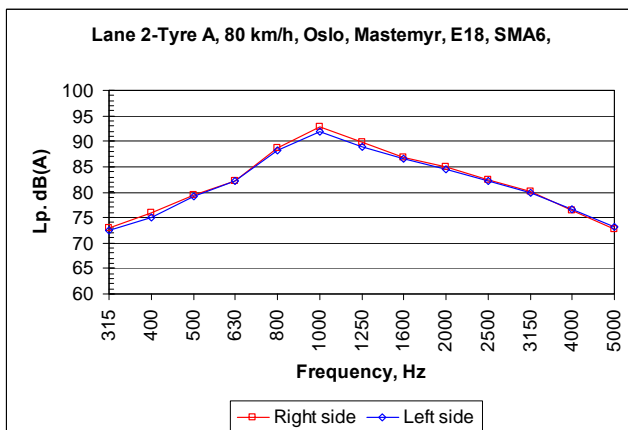
Location	Mastemyr, E18
Road surface type	SMA6
Test section length	220
Direction	Lane 2 Hp1 0.754-0510
Date	21092005
Air temperature	16
Road temperature	14

Lane 2-Tyre A, 80 km/h, Mastemyr, E18, SMA6,				
Total-average speed for dist. 0 - 200 m		79.2 km/h		
Std.dev.		0.23		
dBA / Distance	Air temp	16	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 200 m			
	94.3	94.8	94.1	94.6
Average	for dist. 40 - 220 m		94.1	94.6
Std.dev.			0.26	0.30


**2006:**

Location	Oslo, Mastemyr, E18
Road surface type	SMA6
Test section length	240
Direction	Lane 2
Date	280606
Air temperature	22
Road temperature	25

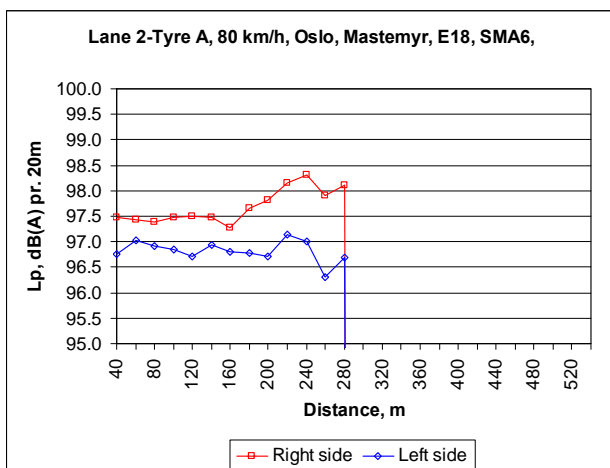
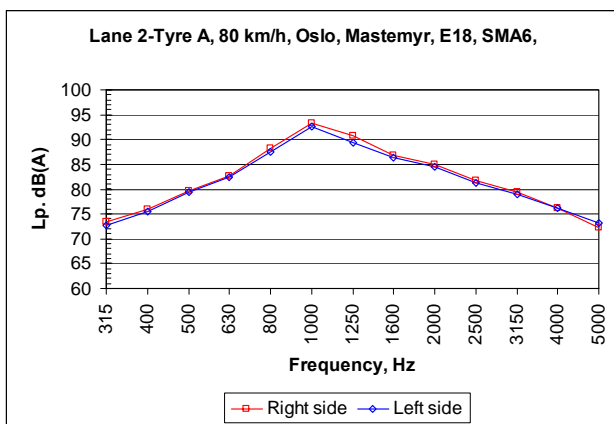
Lane 2-Tyre A, 80 km/h, Oslo, Mastemyr, E18, SMA6,				
Total-average speed for dist. 0 - 240 m		80.0 km/h		
Std.dev.		0.26		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 240 m			
	97.2	96.6	97.3	96.7
Average	for dist. 40 - 260 m		97.3	96.8
Std.dev.			0.12	0.71



**2007:**

Location	Oslo, Mastemyr, E18
Road surface type	SMA6
Test section length	280
Direction	Lane 2
Date	26.06.2007
Air temperature	18
Road temperature	22

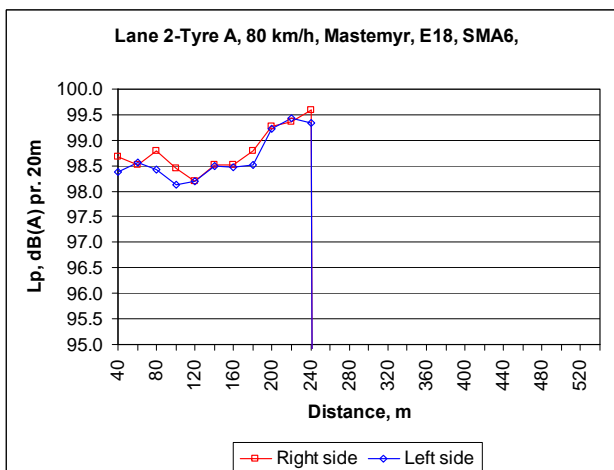
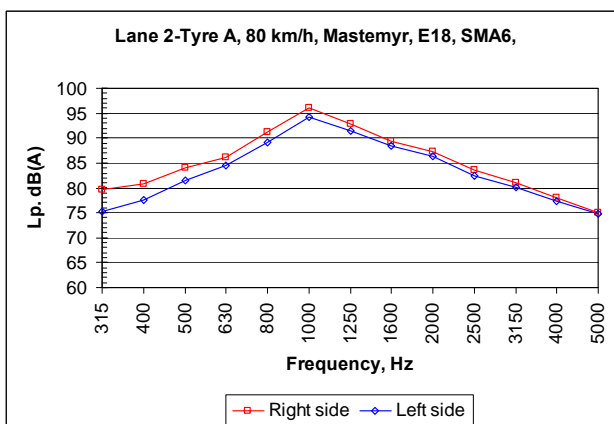
Lane 2-Tyre A, 80 km/h, Oslo, Mastemyr, E18, SMA6,					
Total-average speed for dist. 0 - 280 m		79.3 km/h			
Std.dev.		0.30			
dBA / Distance	Air temp	18 Right s	18 Left s	Temp.corr. to +20C	Temp.corr. to +20C
<k for dist. 0 - 280 m		97.8	96.9	97.6	96.8
Average for dist. 40 - 300 m				97.7	96.8
Std.dev.				0.34	0.21



**2008:**

Location	Mastemyr, E18
Road surface type	SMA6
Test section length	240
Direction	Lane 2
Date	26.06.2008
Air temperature	18
Road temperature	25

Lane 2-Tyre A, 80 km/h, Mastemyr, E18, SMA6,					
Total-average speed for dist. 0 - 240 m		81.9 km/h			
Std.dev.		0.41			
dBA / Distance	Air temp	18 Right s	18 Left s	Temp.corr. to +20C	Temp.corr. to +20C
Total-average for dist. 0 - 240 m		98.9	98.7	98.7	98.6
Average for dist. 40 - 260 m				98.8	98.7
Std.dev.				0.44	0.46

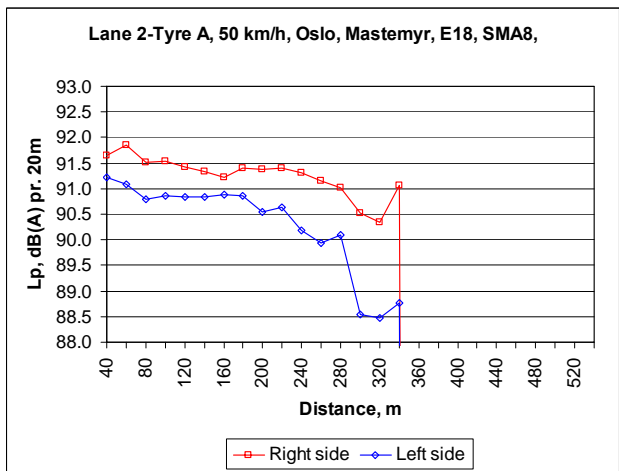
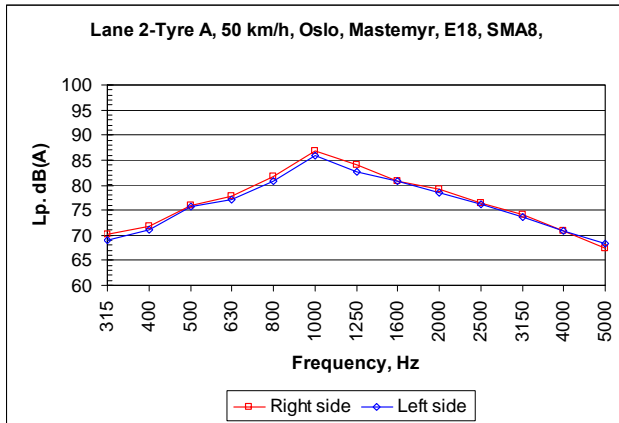


**Pavement 10: SMA8- E18 Mastemyr, lane 2, 50 km/h**

2007:

Location	Oslo, Mastemyr, E18
Road surface type	SMA8
Test section length	340
Direction	Lane 2
Date	26.06.2007
Air temperature	18
Road temperature	22

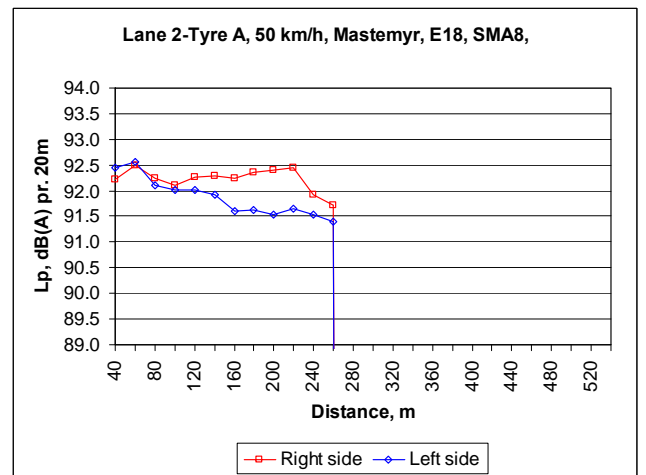
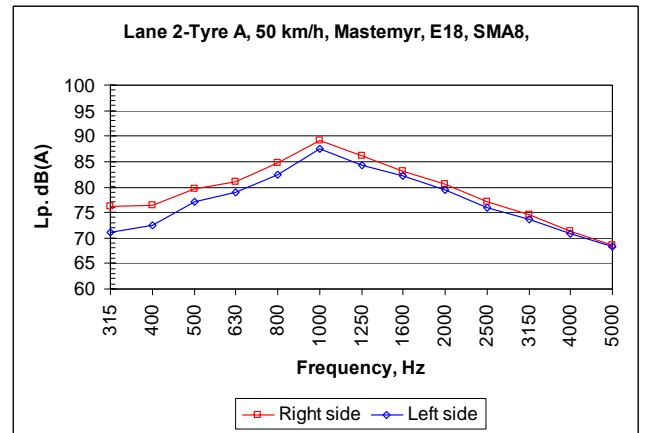
Lane 2-Tyre A, 50 km/h, Oslo, Mastemyr, E18, SMA8,				
Total-average speed for dist. 0 - 340 m		49.8 km/h		
Std.dev.		0.14		
dBA / Distance	Air temp	18	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 340 m				
	91.5	90.7	91.4	90.6
Average	for dist. 40 - 360 m		91.3	90.3
Std.dev.			0.39	0.91



2008:

Location	Mastemyr, E18
Road surface type	SMA8
Test section length	260
Direction	Lane 2
Date	26.06.2008
Air temperature	18
Road temperature	25

Lane 2-Tyre A, 50 km/h, Mastemyr, E18, SMA8,				
Total-average speed for dist. 0 - 260 m		51.6 km/h		
Std.dev.		0.24		
dBA / Distance	Air temp	18	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 260 m				
	92.4	92.0	92.2	91.9
Average	for dist. 40 - 280 m		92.2	91.9
Std.dev.			0.22	0.38

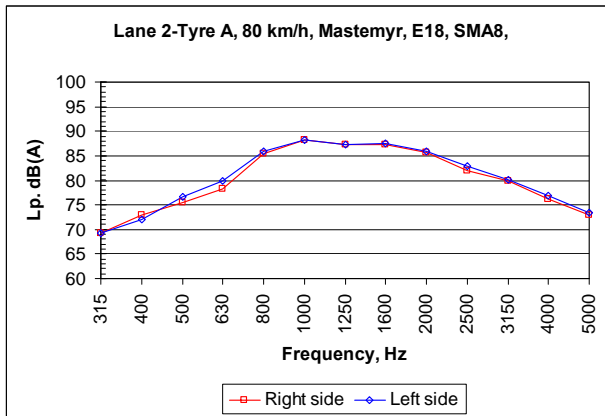


**Pavement 10: SMA8- E18 Mastemyr, lane 2, 80 km/h**

**2005:**

Location	Mastemyr, E18
Road surface type	SMA8
Test section length	240
Direction	Lane 2 Hp1 1.024-0.754
Date	21092005
Air temperature	16
Road temperature	14

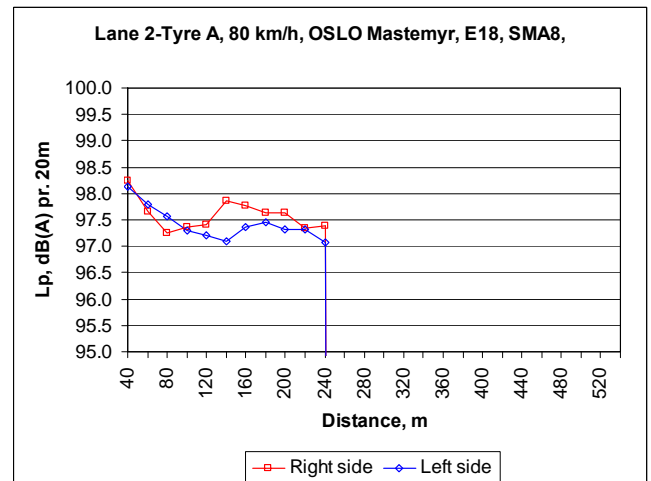
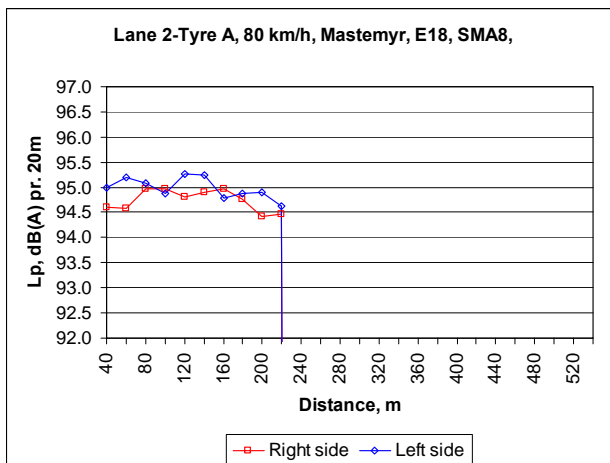
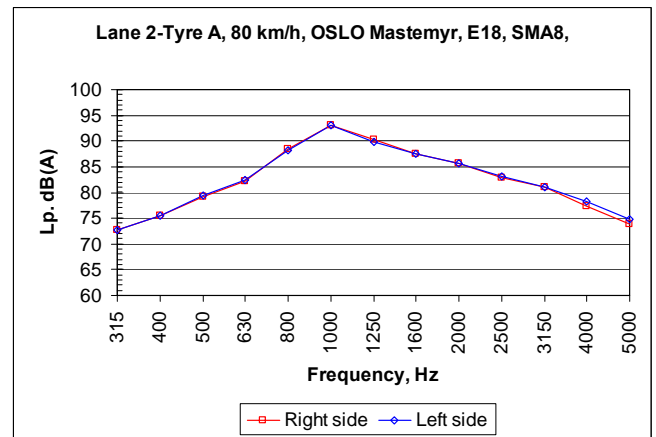
Lane 2-Tyre A, 80 km/h, Mastemyr, E18, SMA8,				
Total-average speed for dist. 0 - 220 m		79.1 km/h		
Std.dev.		0.08		
dBA / Distance	Air temp Right s	Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 220 m	95.0	95.2	94.8	95.0
Average for dist. 40 - 240 m			94.7	95.0
Std.dev.			0.22	0.21



**2006:**

Location	OSLO Mastemyr, E18
Road surface type	SMA8
Test section length	260
Direction	Lane 2
Date	280606
Air temperature	22
Road temperature	25

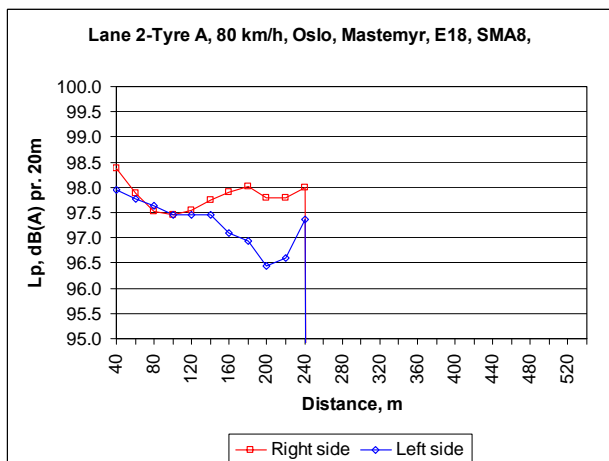
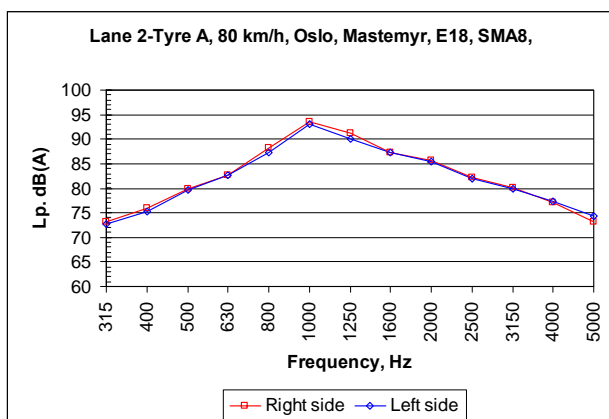
Lane 2-Tyre A, 80 km/h, OSLO Mastemyr, E18, SMA8,				
Total-average speed for dist. 0 - 240 m		79.8 km/h		
Std.dev.		0.13		
dBA / Distance	Air temp Right s	Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 240 m	97.5	97.3	97.6	97.5
Average for dist. 40 - 260 m			97.6	97.4
Std.dev.			0.28	0.31



**2007:**

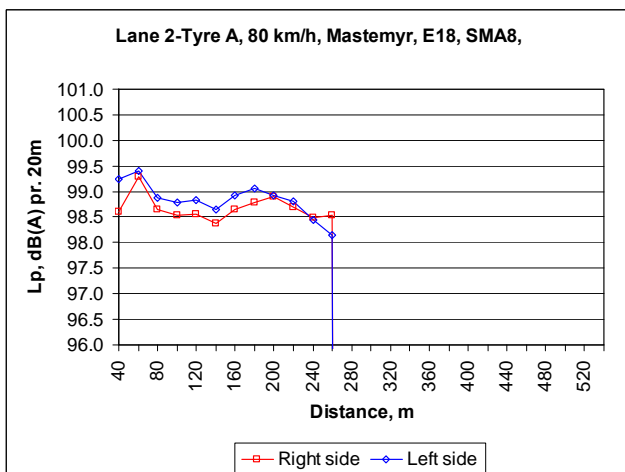
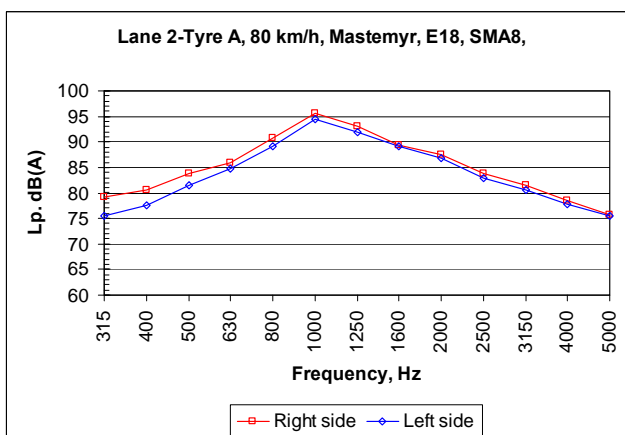
Location	Oslo, Mastemyr, E18
Road surface type	SMA8
Test section length	240
Direction	Lane 2
Date	26.06.2007
Air temperature	18
Road temperature	22

Lane 2-Tyre A, 80 km/h, Oslo, Mastemyr, E18, SMA8,				
Total-average speed for dist. 0 - 240 m		78.8 km/h		
Std.dev.		0.10		
dBA / Distance	Air temp	18	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 240 m				
	98.0	97.4	97.9	97.2
Average for dist. 40 - 260 m				
			97.8	97.3
Std.dev.				
			0.27	0.47


**2008:**

Location	Mastemyr, E18
Road surface type	SMA8
Test section length	260
Direction	Lane 2
Date	26.06.2008
Air temperature	18
Road temperature	25

Lane 2-Tyre A, 80 km/h, Mastemyr, E18, SMA8,				
Total-average speed for dist. 0 - 260 m		81.3 km/h		
Std.dev.		0.30		
dBA / Distance	Air temp	18	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 260 m				
	98.8	99.0	98.7	98.9
Average for dist. 40 - 280 m				
			98.7	98.8
Std.dev.				
			0.24	0.33

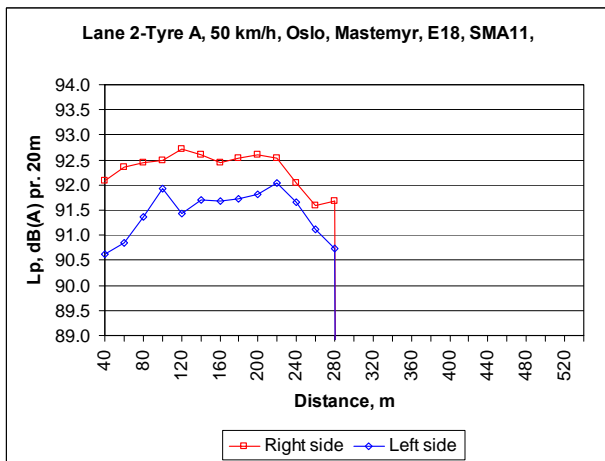
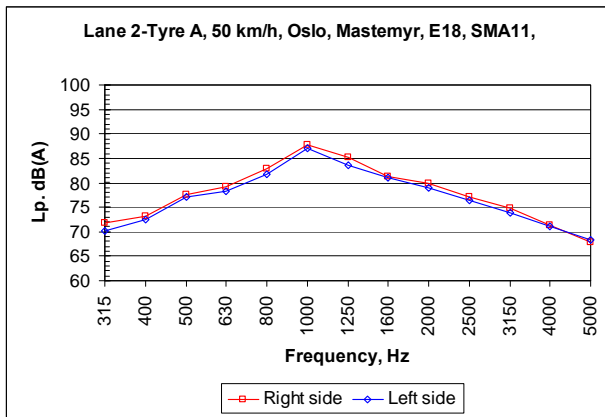


**Pavement 11: SMA11- E18**  
**Mastemyr, lane 2, 50 km/h**

2007:

Location	Oslo, Mastemyr, E18
Road surface type	SMA11
Test section length	280
Direction	Lane 2
Date	26.06.2007
Air temperature	18
Road temperature	22

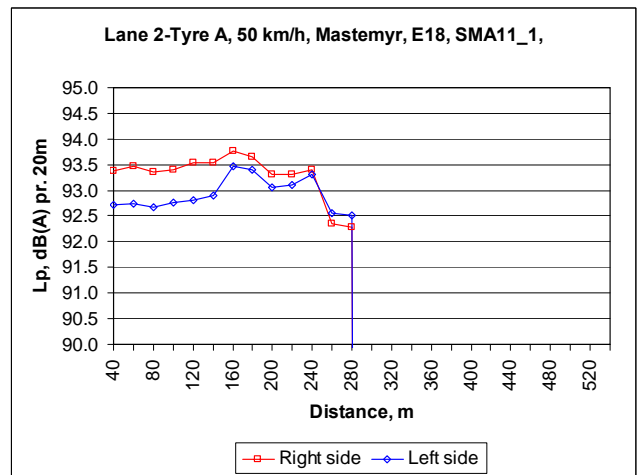
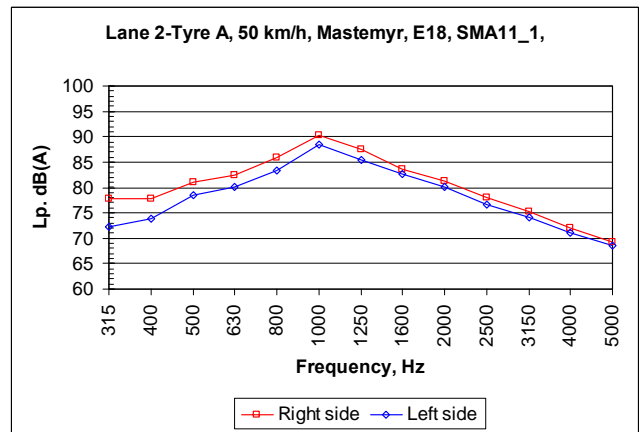
Lane 2-Tyre A, 50 km/h, Oslo, Mastemyr, E18, SMA11,					
Total-average speed for dist. 0 - 280 m		49.8 km/h			
Std.dev.		0.19			
dBA / Distance	Air temp Right s	18 Left s	Temp.corr. to +20C		
<k for dist. 0 - 280 m					
		92.5	91.5	92.4	91.4
Average for dist. 40 - 300 m		92.3			91.4
Std.dev.		0.36			0.47



2008:

Location	Mastemyr, E18
Road surface type	SMA11_1
Test section length	280
Direction	Lane 2
Date	26.06.2008
Air temperature	18
Road temperature	25

Lane 2-Tyre A, 50 km/h, Mastemyr, E18, SMA11_1,					
Total-average speed for dist. 0 - 280 m		50.9 km/h			
Std.dev.		0.61			
dBA / Distance	Air temp Right s	18 Left s	Temp.corr. to +20C		
Total-average for dist. 0 - 280 m		93.5	93.1	93.4	92.9
Average for dist. 40 - 300 m		93.3			92.9
Std.dev.		0.45			0.32

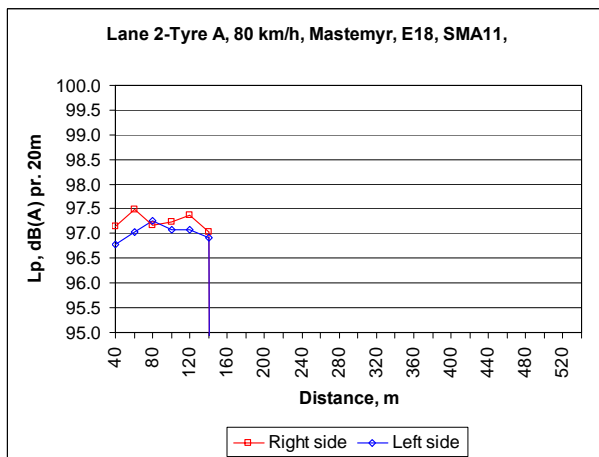
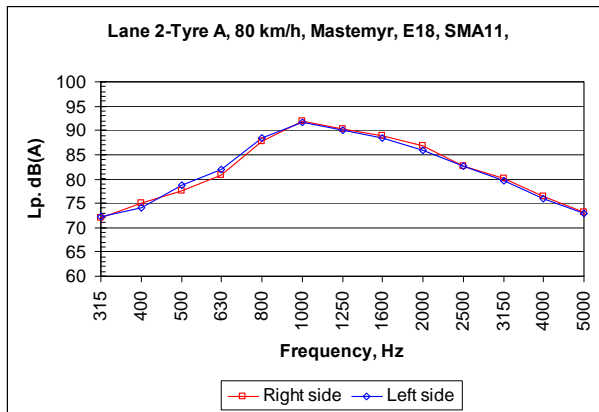


**Pavement 11: SMA11- E18**  
**Mastemyr, lane 2, 80 km/h**

**2005:**

Location	Mastemyr, E18
Road surface type	SMA11
Test section length	160
Direction	Lane 2 Hp1 1.294-1.024
Date	21092005
Air temperature	16
Road temperature	14

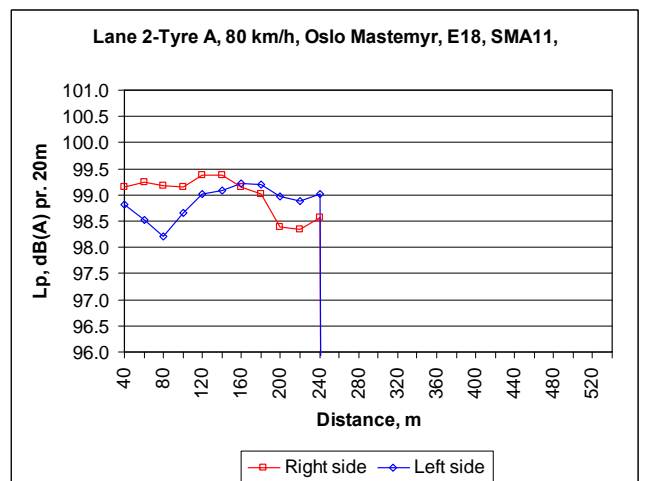
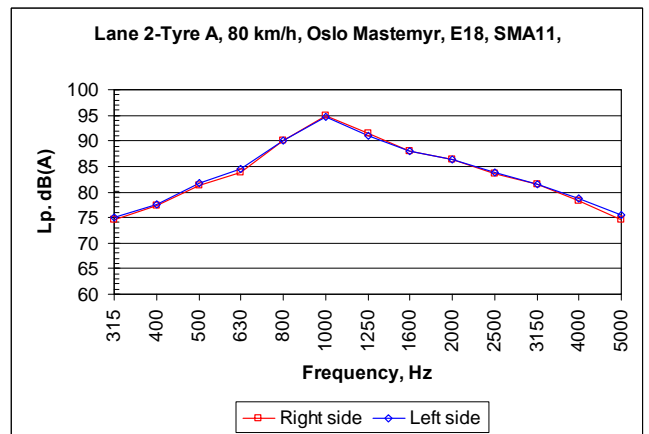
Lane 2-Tyre A, 80 km/h, Mastemyr, E18, SMA11,				
Total-average speed for dist. 0 - 140 m		79.0		km/h
Std.dev.		0.09		
dBA / Distance	Air temp	16	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 140 m		97.2		97.0
		97.4	97.2	
Average for dist. 40 - 160 m		97.2		97.0
Std.dev.		0.17		0.16



**2006:**

Location	Oslo Mastemyr, E18
Road surface type	SMA11
Test section length	240
Direction	Lane 2
Date	280606
Air temperature	22
Road temperature	25

Lane 2-Tyre A, 80 km/h, Oslo Mastemyr, E18, SMA11,				
Total-average speed for dist. 0 - 240 m		79.6		km/h
Std.dev.		0.28		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 240 m		98.8		98.9
		98.9	99.0	98.9
Average for dist. 40 - 260 m		99.0		98.9
Std.dev.		0.38		0.31

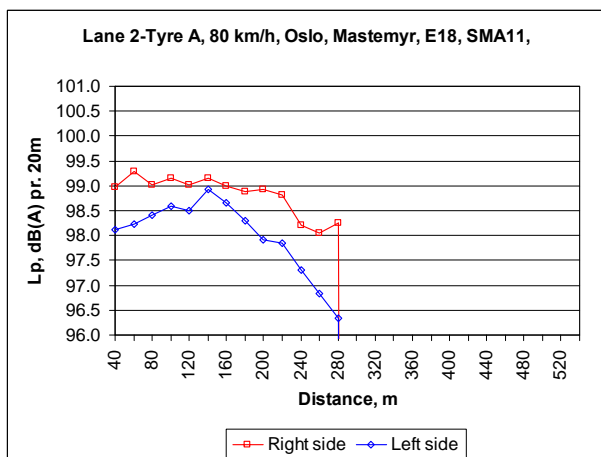
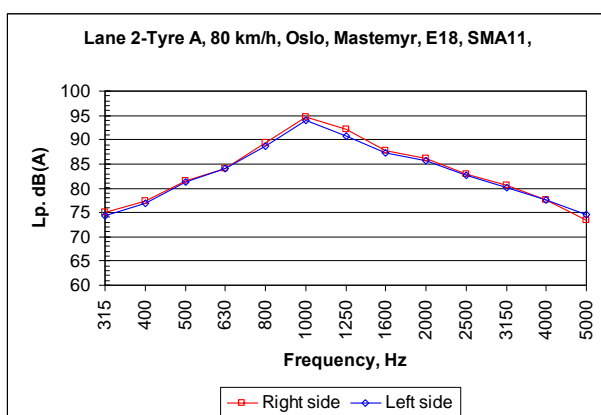




**2007:**

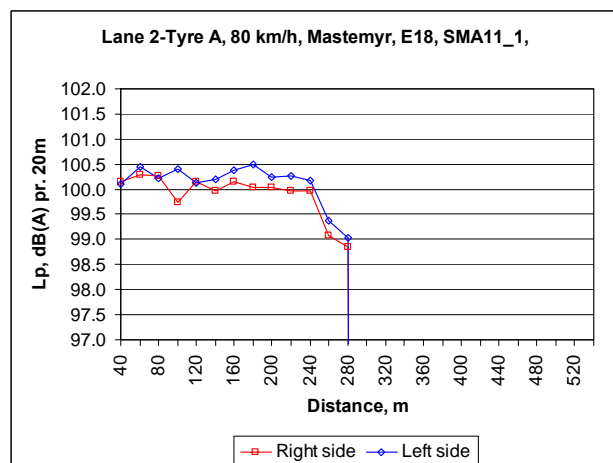
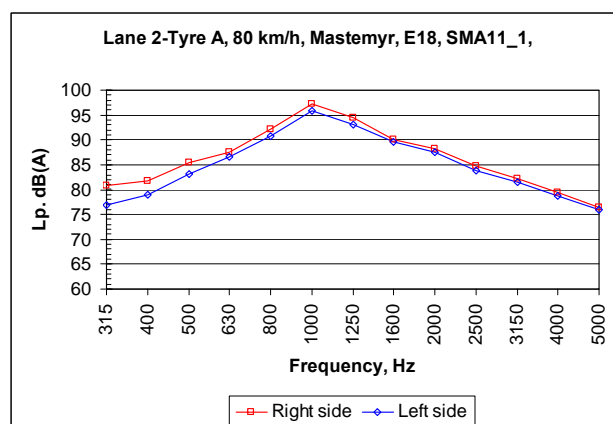
Location	Oslo, Mastemyr, E18
Road surface type	SMA11
Test section length	280
Direction	Lane 2
Date	26.06.2007
Air temperature	18
Road temperature	22

Lane 2-Tyre A, 80 km/h, Oslo, Mastemyr, E18, SMA11,				
Total-average speed for dist. 0 - 280 m		78.6 km/h		
Std.dev.		0.18		
dBA / Distance	Air temp	18 Right s	Left s	Temp.corr. to +20C
<k for dist. 0 - 280 m				
		98.9	98.2	98.8 98.1
Average for dist. 40 - 300 m		98.8 98.0		
Std.dev.		0.39 0.75		


**2008:**

Location	Mastemyr, E18
Road surface type	SMA11_1
Test section length	280
Direction	Lane 2
Date	26.06.2008
Air temperature	18
Road temperature	25

Lane 2-Tyre A, 80 km/h, Mastemyr, E18, SMA11_1,				
Total-average speed for dist. 0 - 280 m		80.4 km/h		
Std.dev.		0.75		
dBA / Distance	Air temp	18 Right s	Left s	Temp.corr. to +20C
Total-average for dist. 0 - 280 m				
		100.1	100.3	100.0 100.1
Average for dist. 40 - 300 m		99.9 100.1		
Std.dev.		0.44 0.43		

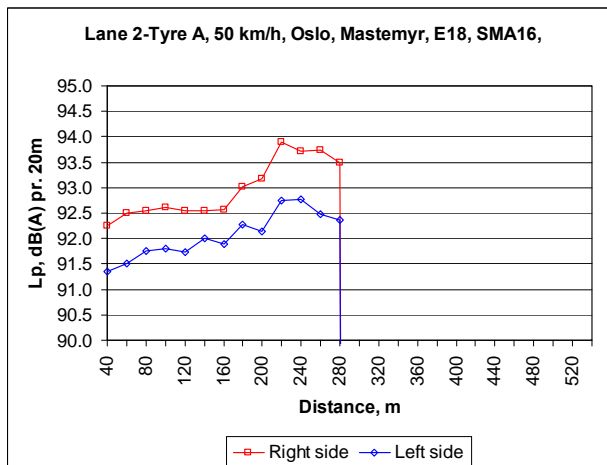
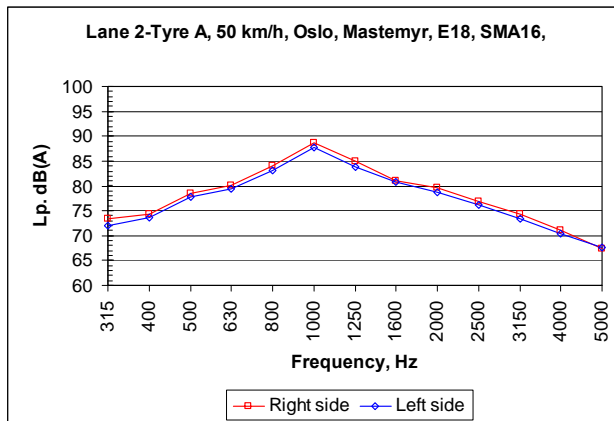


**Pavement 12: SMA16- E18**  
**Mastemyr, lane 2, 50 km/h**

**2007:**

Location	Oslo, Mastemyr, E18
Road surface type	SMA16
Test section length	280
Direction	Lane 2
Date	26.06.2007
Air temperature	18
Road temperature	22

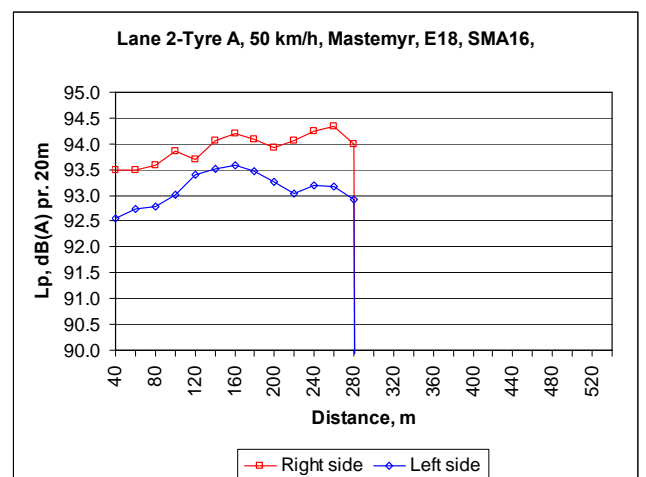
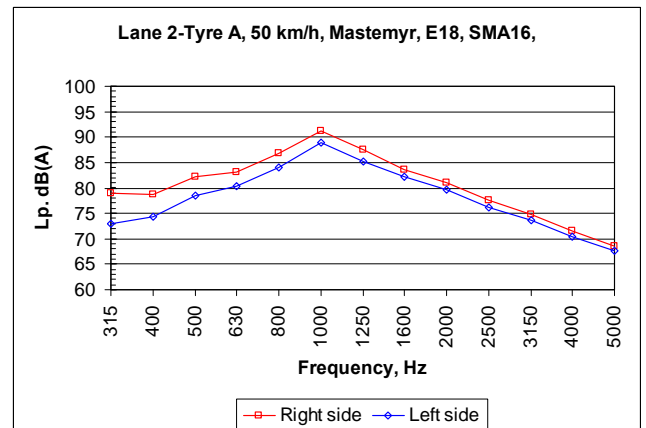
Lane 2-Tyre A, 50 km/h, Oslo, Mastemyr, E18, SMA16,				
Total-average speed for dist. 0 - 280 m		49.1 km/h		
Std.dev.		1.49		
dBA / Distance	Air temp	18	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 280 m				
		93.0	92.1	
Average for dist. 40 - 300 m		93.0		
Std.dev.		0.57		
		92.0		
		92.1		
		0.45		



**2008:**

Location	Mastemyr, E18
Road surface type	SMA16
Test section length	280
Direction	Lane 2
Date	26.06.2008
Air temperature	18
Road temperature	25

Lane 2-Tyre A, 50 km/h, Mastemyr, E18, SMA16,				
Total-average speed for dist. 0 - 280 m		50.3 km/h		
Std.dev.		0.63		
dBA / Distance	Air temp	18	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 280 m				
		94.0	93.2	
Average for dist. 40 - 300 m		93.9		
Std.dev.		0.28		
		93.1		
		93.1		
		0.32		

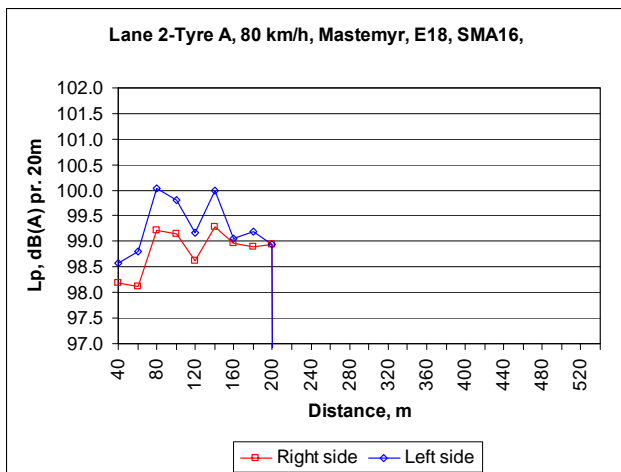
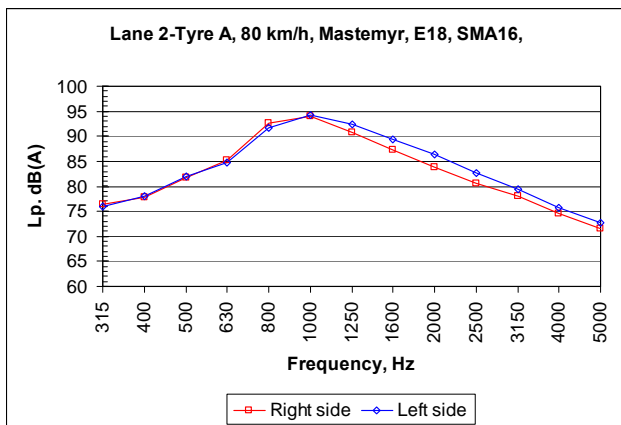


### Pavement 12: SMA16- E18 Mastemyr, lane 2, 80 km/h

**2005:**

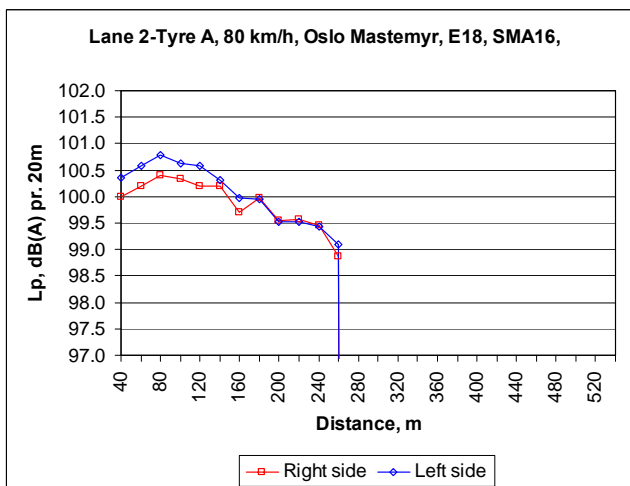
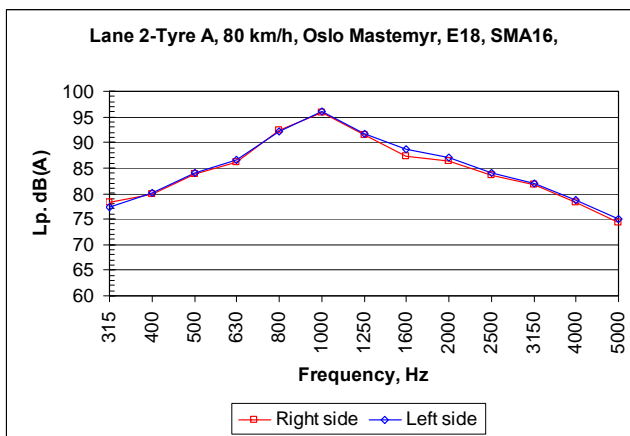
Location	Mastemyr, E18
Road surface type	SMA16
Test section length	220
Direction	Lane 2 Hp1 1.577-1.294
Date	21092005
Air temperature	16
Road temperature	14

Lane 2-Tyre A, 80 km/h, Mastemyr, E18, SMA16,				
Total-average speed for dist. 0 - 200 m		79.5 km/h		
Std.dev.		0.38		
dBA / Distance	Air temp	Right s	Left s	Temp.corr. to +20C
	16			Right side Left side
Total-average for dist. 0 - 200 m				
	99.0	99.4	98.8 99.2	
Average for dist. 40 - 220 m		98.8 99.3		
Std.dev.		0.43 0.53		


**2006:**

Location	Oslo Mastemyr, E18
Road surface type	SMA16
Test section length	260
Direction	Lane 2
Date	280606
Air temperature	22
Road temperature	25

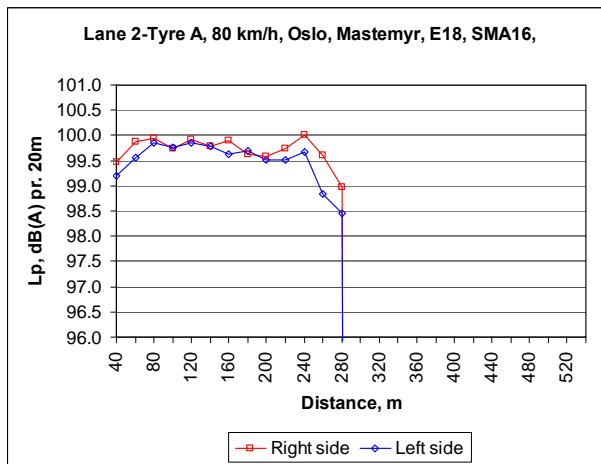
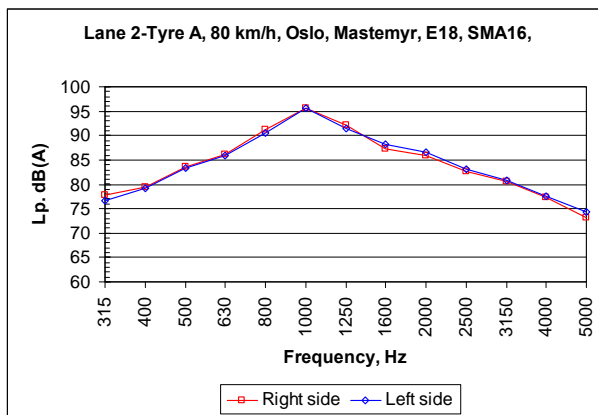
Lane 2-Tyre A, 80 km/h, Oslo Mastemyr, E18, SMA16,				
Total-average speed for dist. 0 - 260 m		80.8 km/h		
Std.dev.		1.43		
dBA / Distance	Air temp	Right s	Left s	Temp.corr. to +20C
	22			Right side Left side
Total-average for dist. 0 - 260 m				
	99.7	99.9	99.9 100.1	
Average for dist. 40 - 280 m		99.9 100.1		
Std.dev.		0.45 0.56		



**2007:**

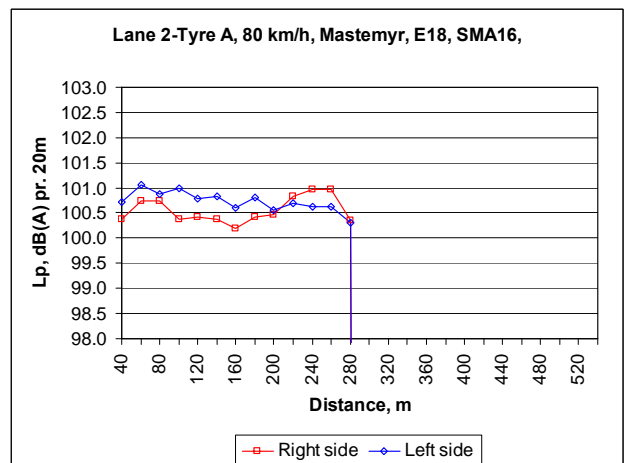
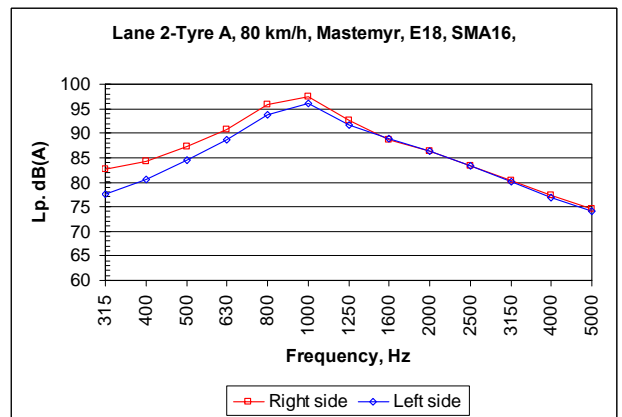
Location	Oslo, Mastemyr, E18
Road surface type	SMA16
Test section length	280
Direction	Lane 2
Date	26.06.2007
Air temperature	18
Road temperature	22

Lane 2-Tyre A, 80 km/h, Oslo, Mastemyr, E18, SMA16,				
Total-average speed for dist. 0 - 280 m		79.7 km/h		
Std.dev.		0.84		
dBA / Distance	Air temp Right s	18 Left s	Temp.corr. to +20C Right side	Left side
<k for dist. 0 - 280 m				
Average		99.8	99.6	99.5
Std.dev.		for dist. 40 - 300 m		
		0.27	0.42	


**2008:**

Location	Mastemyr, E18
Road surface type	SMA16
Test section length	280
Direction	Lane 2
Date	26.06.2008
Air temperature	18
Road temperature	25

Lane 2-Tyre A, 80 km/h, Mastemyr, E18, SMA16,				
Total-average speed for dist. 0 - 280 m		81.0 km/h		
Std.dev.		0.66		
dBA / Distance	Air temp Right s	18 Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 280 m				
Average		100.7	100.9	100.7
Std.dev.		for dist. 40 - 300 m		
		0.26	0.19	

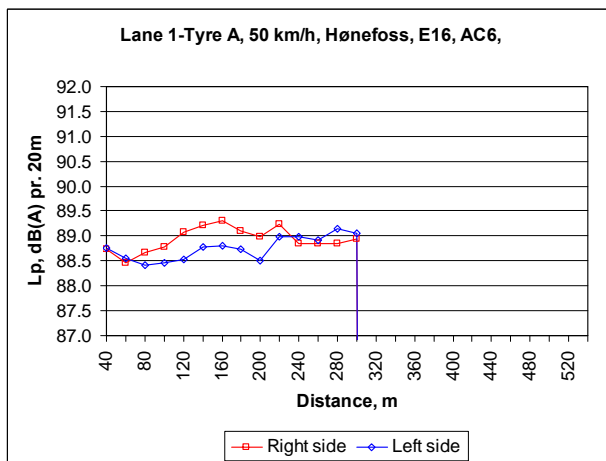
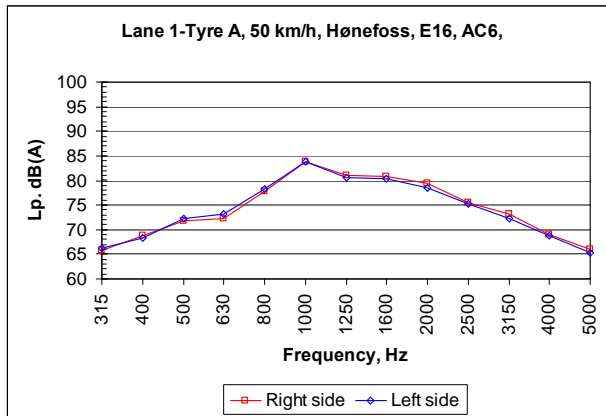


### Pavement 13: AC6. E16- Hønefoss, lane 1, 50 km/h

**2005:**

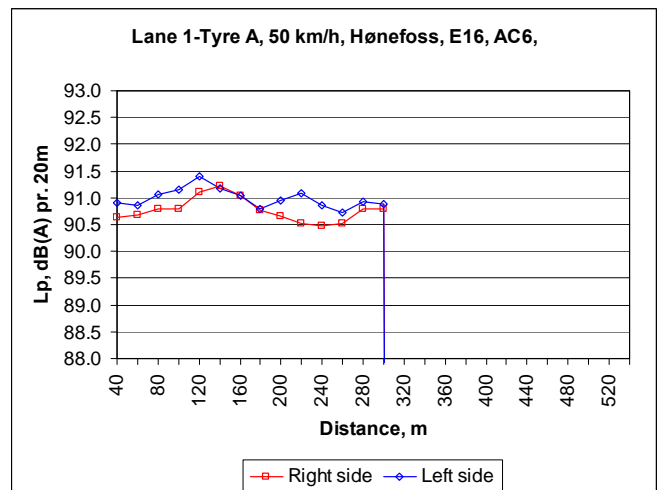
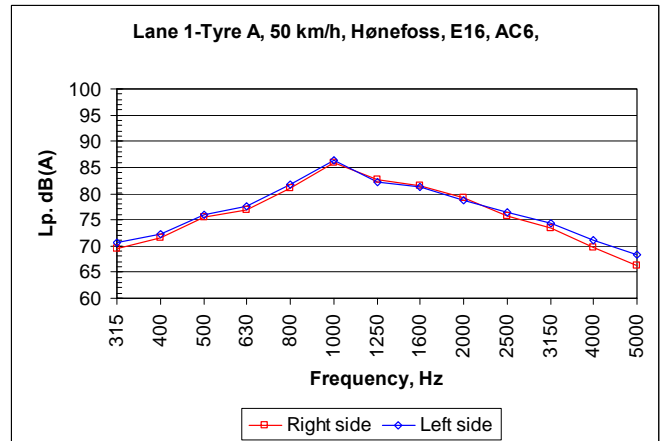
Location	Hønefoss, E16		
Road surface type	AC6		
Test section length	320		
Direction	Lane 1		
Date	21092005		
Air temperature			17
Road temperature			15

Lane 1-Tyre A, 50 km/h, Hønefoss, E16, AC6,				
Total-average speed for dist. 0 - 300 m		50.5 km/h		
Std.dev.		0.13		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 300 m				
	89.1	89.0	88.9	88.8
Average for dist. 40 - 320 m			88.9	88.8
Std.dev.			0.24	0.23


**2006:**

Location	Hønefoss, E16		
Road surface type	AC6		
Test section length	300		
Direction	Lane 1		
Date	280606		
Air temperature			17
Road temperature			21

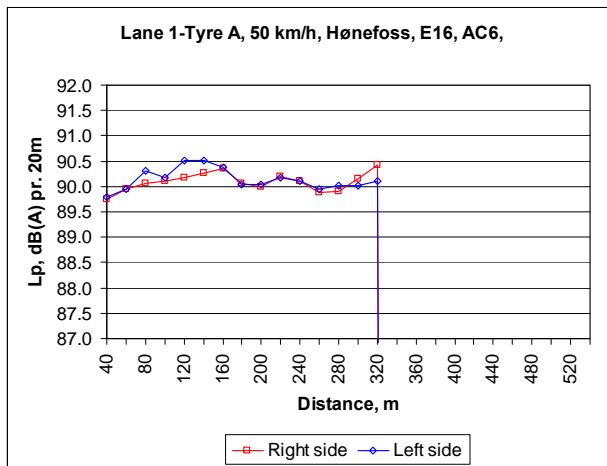
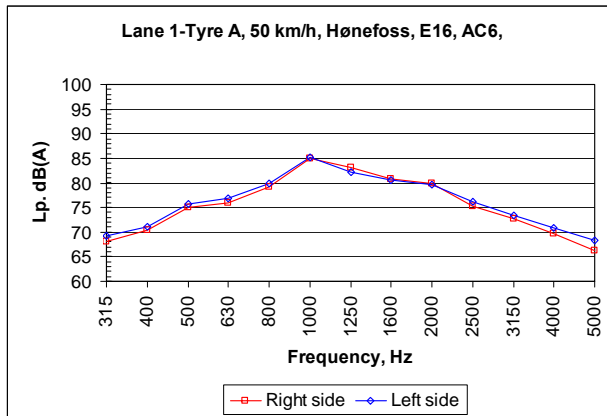
Lane 1-Tyre A, 50 km/h, Hønefoss, E16, AC6,				
Total-average speed for dist. 0 - 300 m		50.4 km/h		
Std.dev.		0.12		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 300 m				
	90.9	91.2	90.8	91.0
Average for dist. 40 - 320 m			90.8	91.0
Std.dev.			0.22	0.18



2007:

Location	Hønefoss, E16
Road surface type	AC6
Test section length	320
Direction	Lane 1
Date	26.06.2007
Air temperature	22
Road temperature	32

Lane 1-Tyre A, 50 km/h, Hønefoss, E16, AC6,				
Total-average speed for dist. 0 - 320 m		50.8 km/h		
Std.dev.		0.11		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 320 m				
	90.0	90.0	90.1	90.1
Average for dist. 40 - 340 m				
Std.dev.			0.18	0.21

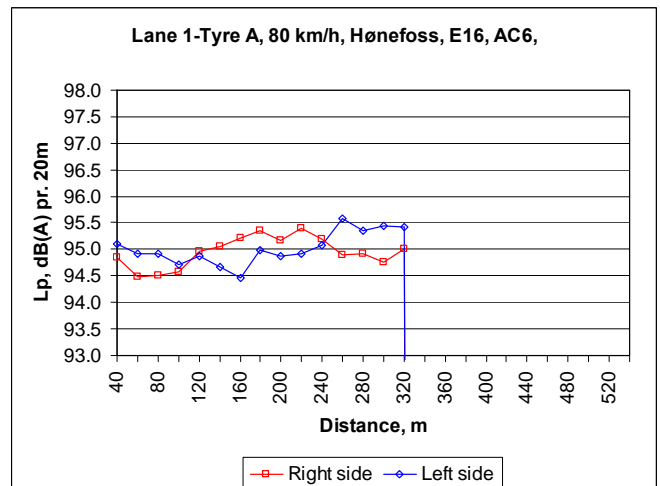
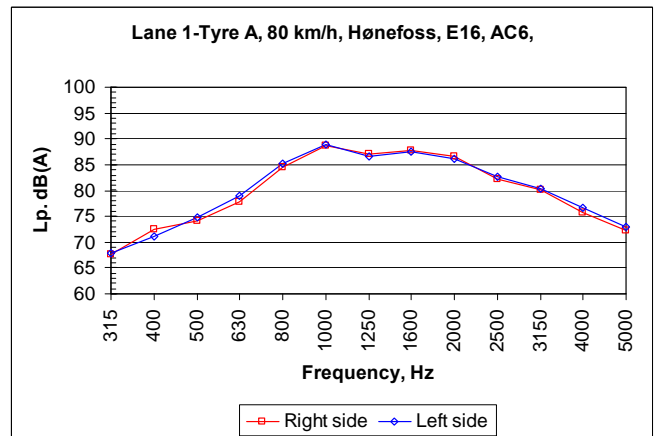


**Pavement 13: AC6. E16- Hønefoss, lane 1, 80 km/h**

2005:

Location	Hønefoss, E16
Road surface type	AC6
Test section length	320
Direction	Lane 1 towards Nes
Date	21092005
Air temperature	17
Road temperature	15

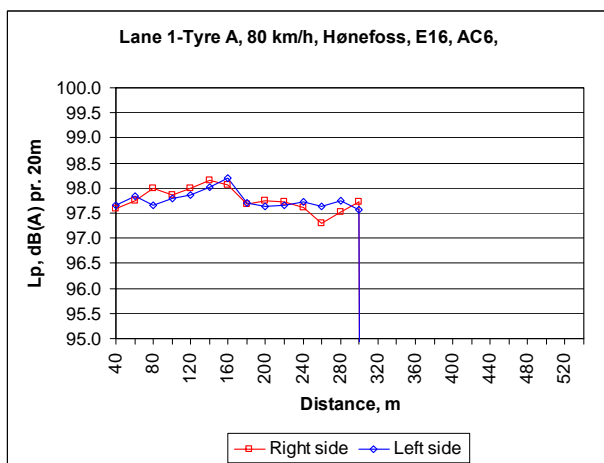
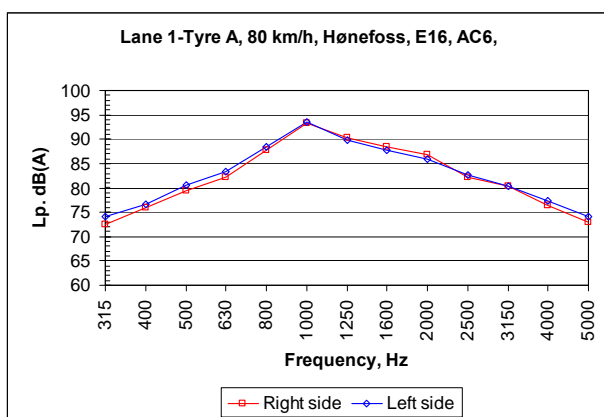
Lane 1-Tyre A, 80 km/h, Hønefoss, E16, AC6,				
Total-average speed for dist. 0 - 320 m		80.2 km/h		
Std.dev.		0.13		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 320 m				
	95.1	95.2	95.0	95.0
Average for dist. 40 - 340 m				
Std.dev.			0.29	0.32



**2006:**

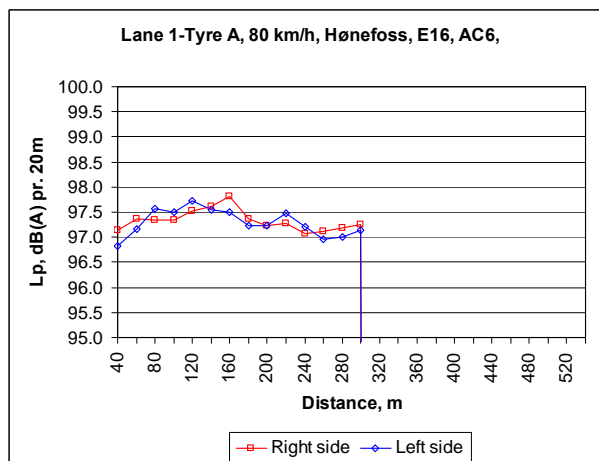
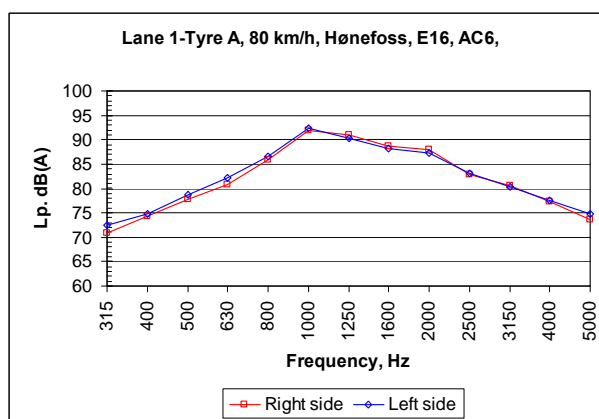
Location	Hønefoss, E16
Road surface type	AC6
Test section length	300
Direction	Lane 1 towards Nes
Date	280606
Air temperature	17
Road temperature	21

Lane 1-Tyre A, 80 km/h, Hønefoss, E16, AC6,				
Total-average speed for dist. 0 - 300 m		80.3 km/h		
Std.dev.		0.10		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 300 m				
	97.9	97.9	97.8	97.8
Average for dist. 40 - 320 m				
			97.8	97.8
Std.dev.		0.23 0.17		


**2007:**

Location	Hønefoss, E16
Road surface type	AC6
Test section length	300
Direction	Lane 1
Date	26.06.2007
Air temperature	22
Road temperature	32

Lane 1-Tyre A, 80 km/h, Hønefoss, E16, AC6,				
Total-average speed for dist. 0 - 300 m		79.7 km/h		
Std.dev.		0.15		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 300 m				
	97.2	97.1	97.3	97.3
Average for dist. 40 - 320 m				
			97.3	97.3
Std.dev.		0.21 0.27		

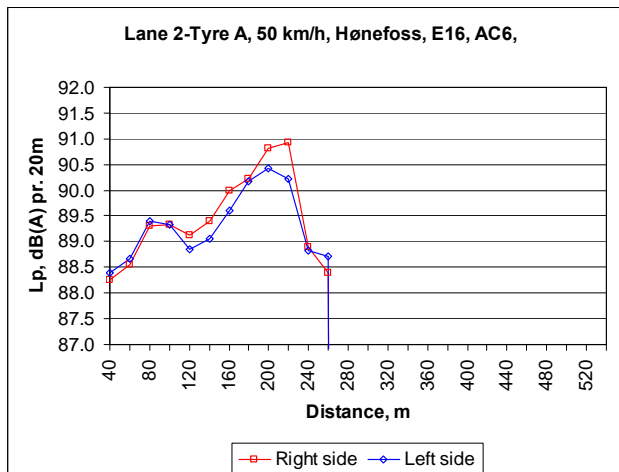
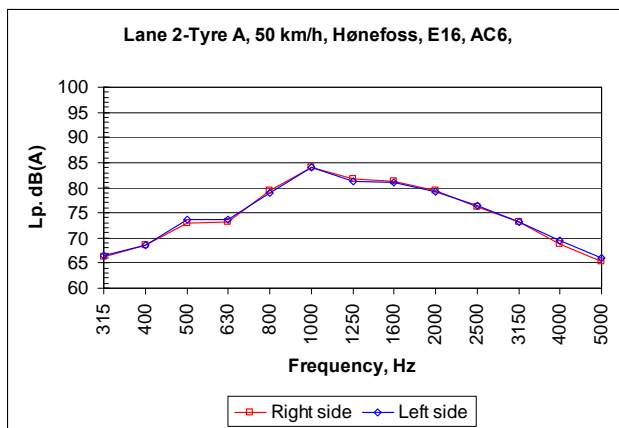


### Pavement 13: AC6. E16- Hønefoss, lane 2, 50 km/h

**2005:**

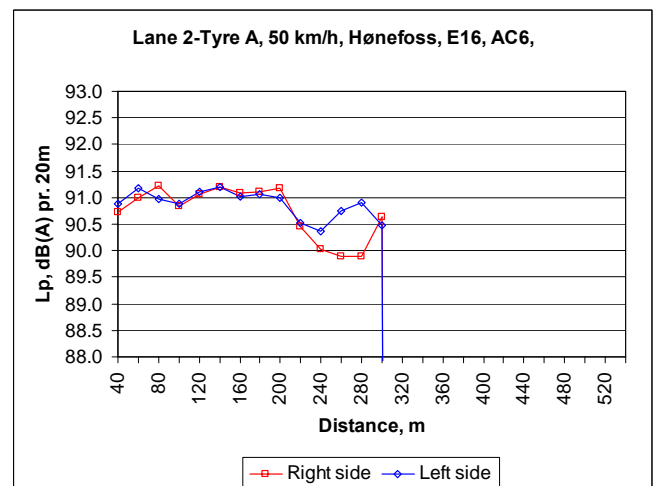
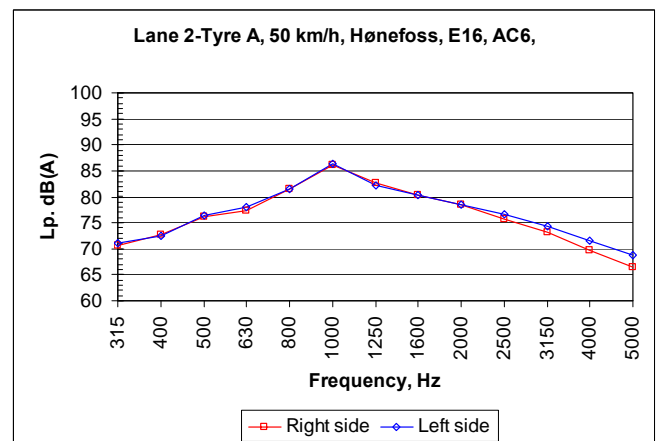
Location	Hønefoss, E16
Road surface type	AC6
Test section length	240
Direction	Lane 2 towards Hønefoss
Date	21092005
Air temperature	17
Road temperature	15

Lane 2-Tyre A, 50 km/h, Hønefoss, E16, AC6,				
Total-average speed for dist. 0 - 260 m		48.4 km/h		
Std.dev.		1.93		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 260 m			
	89.6	89.3	89.4	89.2
Average	for dist. 40 - 280 m		89.4	89.3
Std.dev.			0.89	0.68


**2006:**

Location	Hønefoss, E16
Road surface type	AC6
Test section length	300
Direction	Lane 2 towards Hønefoss
Date	280606
Air temperature	17
Road temperature	21

Lane 2-Tyre A, 50 km/h, Hønefoss, E16, AC6,				
Total-average speed for dist. 0 - 300 m		50.3 km/h		
Std.dev.		0.18		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 300 m			
	90.9	91.1	90.7	90.9
Average	for dist. 40 - 320 m		90.7	90.9
Std.dev.			0.49	0.26

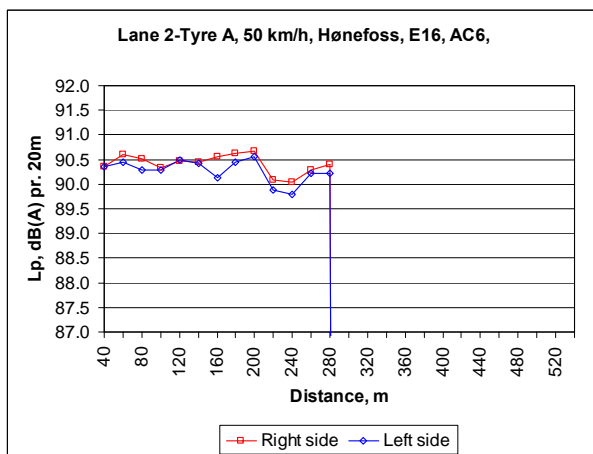
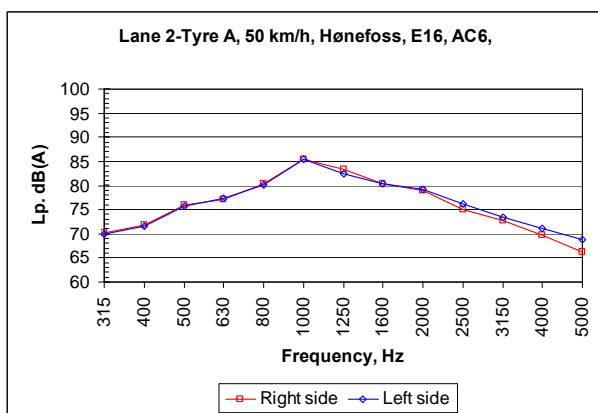




2007:

Location	Hønefoss, E16
Road surface type	AC6
Test section length	280
Direction	Lane 2
Date	26.06.2007
Air temperature	22
Road temperature	32

Lane 2-Tyre A, 50 km/h, Hønefoss, E16, AC6,				
Total-average speed for dist. 0 - 280 m		50.9 km/h		
Std.dev.		0.10		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 280 m				
	90.2	90.1	90.4	90.3
Average for dist. 40 - 300 m				
Std.dev.			0.20	0.23

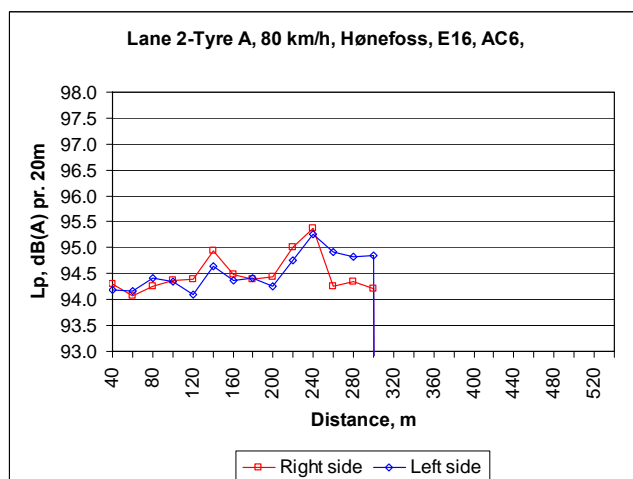
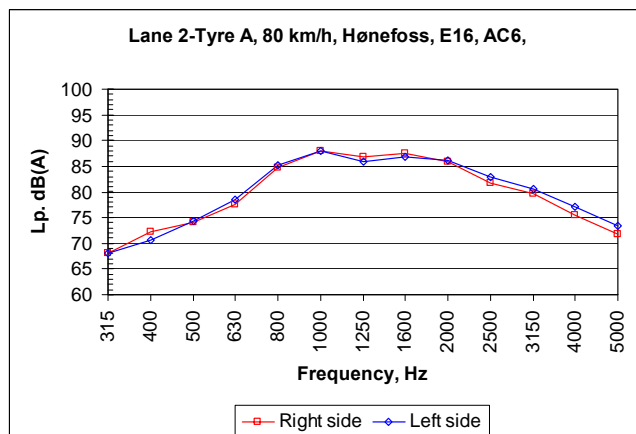


**Pavement 13: AC6. E16- Hønefoss, lane 2, 80 km/h**

2005:

Location	Hønefoss, E16
Road surface type	AC6
Test section length	300
Direction	Lane 2 towards Hønefoss
Date	21092005
Air temperature	17
Road temperature	15

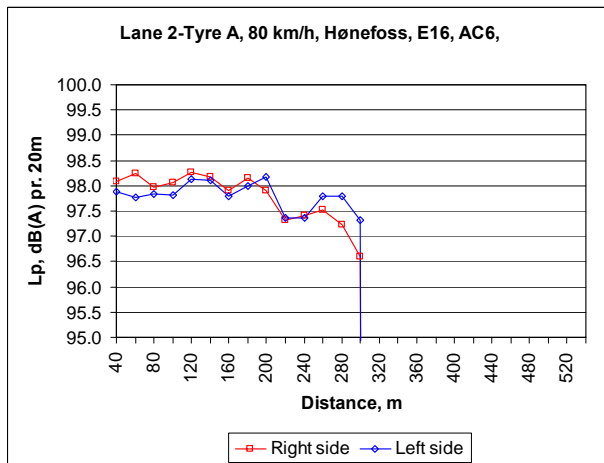
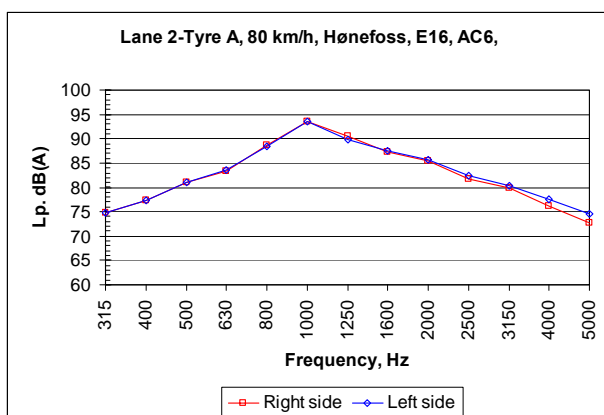
Lane 2-Tyre A, 80 km/h, Hønefoss, E16, AC6,				
Total-average speed for dist. 0 - 300 m		81.0 km/h		
Std.dev.		0.26		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 300 m				
	94.7	94.8	94.5	94.6
Average for dist. 40 - 320 m				
Std.dev.			0.36	0.34



**2006:**

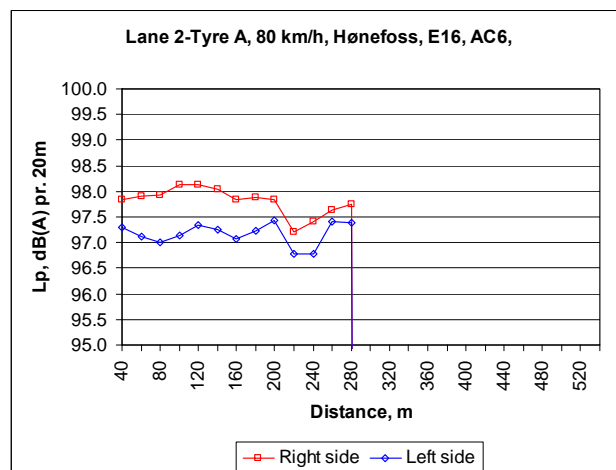
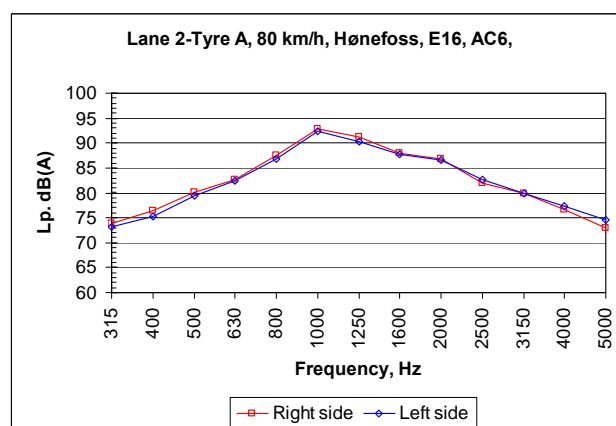
Location	Hønefoss, E16
Road surface type	AC6
Test section length	300
Direction	Lane 2 towards Hønefoss
Date	280606
Air temperature	17
Road temperature	21

Lane 2-Tyre A, 80 km/h, Hønefoss, E16, AC6,				
Total-average speed for dist. 0 - 300 m		80.3 km/h		
Std.dev.		0.13		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 300 m			
	98.0	98.0	97.8	97.8
Average	for dist. 40 - 320 m			
Std.dev.			0.49	0.28


**2007:**

Location	Hønefoss, E16
Road surface type	AC6
Test section length	280
Direction	Lane 2
Date	26.06.2007
Air temperature	22
Road temperature	32

Lane 2-Tyre A, 80 km/h, Hønefoss, E16, AC6,				
Total-average speed for dist. 0 - 280 m		79.8 km/h		
Std.dev.		0.12		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	<k for dist. 0 - 280 m			
	97.6	97.0	97.7	97.1
Average	for dist. 40 - 300 m			
Std.dev.			0.27	0.22

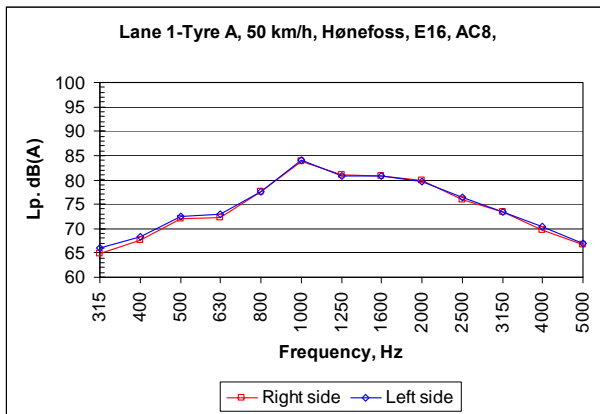


**Pavement 14: AC8. E16- Hønefoss, lane 1, 50 km/h**

2005:

Location	Hønefoss, E16		
Road surface type	AC8		
Test section length	260		
Direction	Lane 1 towards Nes		
Date	21092005		
Air temperature			17
Road temperature			15

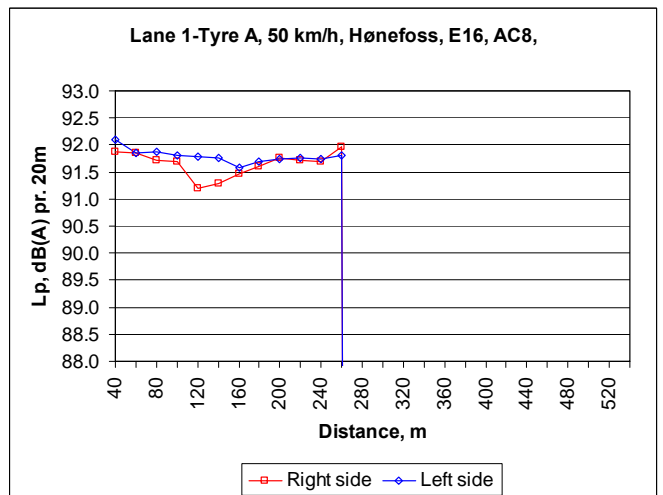
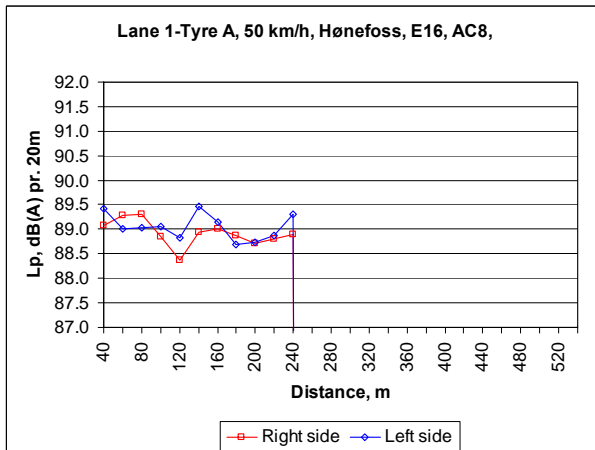
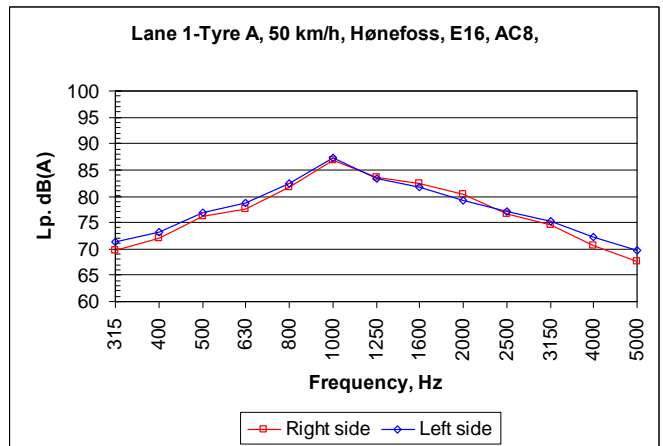
Lane 1-Tyre A, 50 km/h, Hønefoss, E16, AC8,				
Total-average speed for dist. 0 - 240 m		50.5 km/h		
Std.dev.		0.10		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 240 m				
	89.1	89.2	88.9	89.1
Average for dist. 40 - 260 m				
			88.9	89.0
Std.dev.				
			0.26	0.26



2006:

Location	Hønefoss, E16		
Road surface type	AC8		
Test section length	260		
Direction	Lane 1 towards Nes		
Date	280606		
Air temperature			17
Road temperature			21

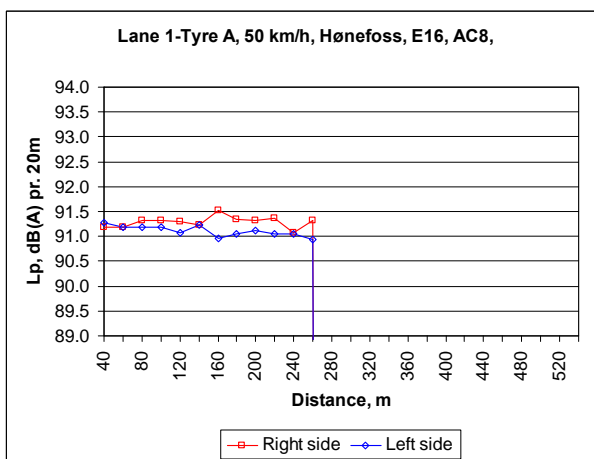
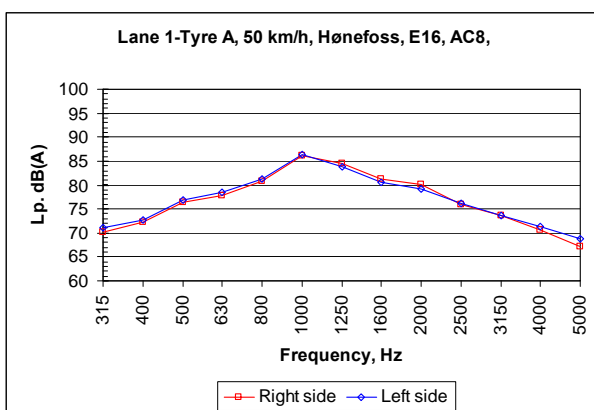
Lane 1-Tyre A, 50 km/h, Hønefoss, E16, AC8,				
Total-average speed for dist. 0 - 260 m		50.4 km/h		
Std.dev.		0.08		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 260 m				
	91.8	92.0	91.6	91.8
Average for dist. 40 - 280 m				
			91.7	91.8
Std.dev.				
			0.23	0.12



2007:

Location	Hønefoss, E16
Road surface type	AC8
Test section length	260
Direction	Lane 1
Date	26.06.2007
Air temperature	22
Road temperature	32

Lane 1-Tyre A, 50 km/h, Hønefoss, E16, AC8,				
Total-average speed for dist. 0 - 260 m		50.9 km/h		
Std.dev.		0.10		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 260 m				
	91.1	91.0	91.2	91.1
Average for dist. 40 - 280 m				
			91.3	91.1
Std.dev.				
			0.11	0.11

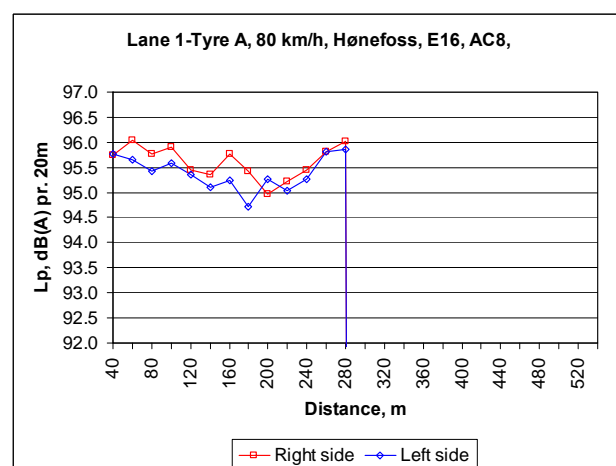
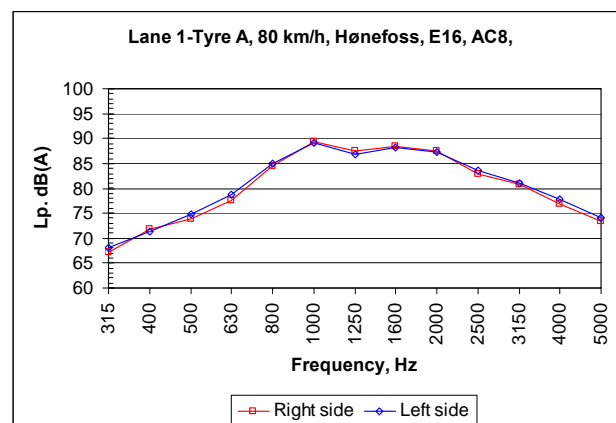


**Pavement 14: AC8. E16- Hønefoss, lane 1, 80 km/h**

2005:

Location	Hønefoss, E16
Road surface type	AC8
Test section length	300
Direction	Lane 1 towards Nes
Date	21092005
Air temperature	17
Road temperature	15

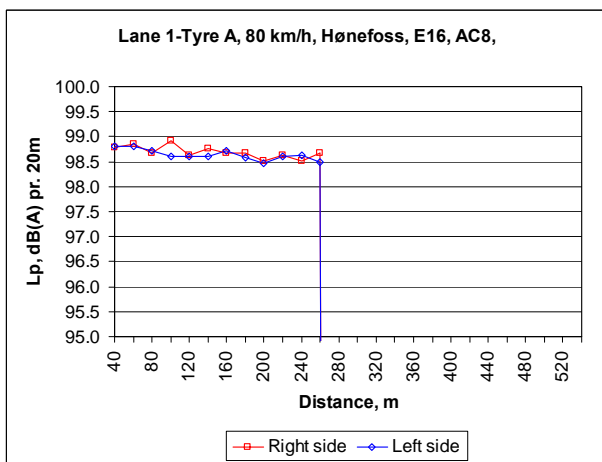
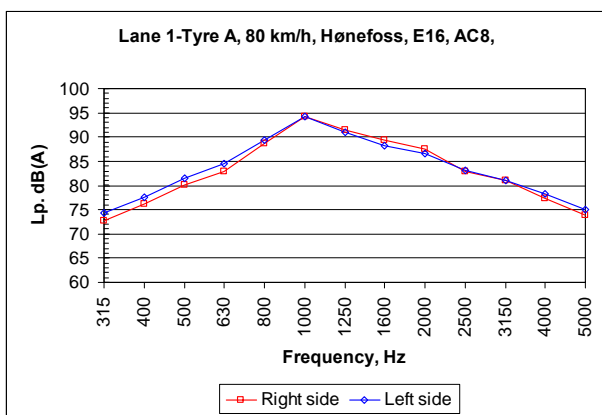
Lane 1-Tyre A, 80 km/h, Hønefoss, E16, AC8,				
Total-average speed for dist. 0 - 280 m		80.4 km/h		
Std.dev.		0.14		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 280 m				
	95.8	95.6	95.6	95.4
Average for dist. 40 - 300 m				
			95.6	95.4
Std.dev.				
			0.33	0.34



**2006:**

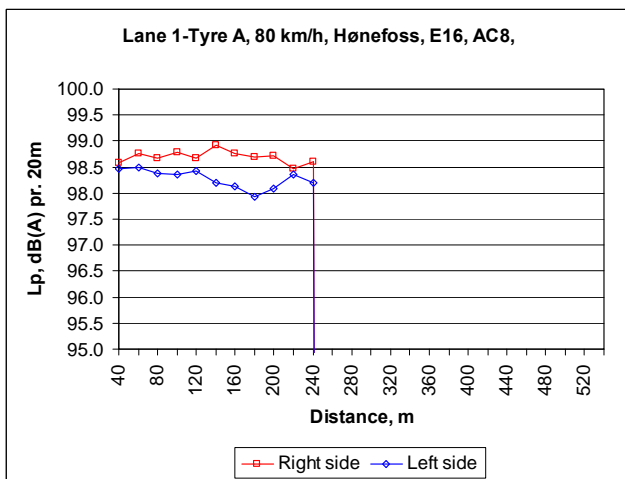
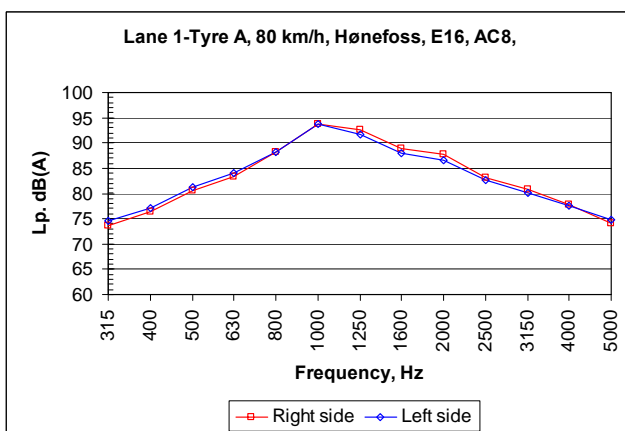
Location	Hønefoss, E16
Road surface type	AC8
Test section length	260
Direction	Lane 1 towards Nes
Date	280606
Air temperature	17
Road temperature	21

Lane 1-Tyre A, 80 km/h, Hønefoss, E16, AC8,				
Total-average speed for dist. 0 - 260 m		80.4 km/h		
Std.dev.		0.15		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 260 m				
	98.8	98.8	98.7	98.6
Average for dist. 40 - 280 m				
			98.7	98.6
Std.dev.		0.12 0.11		


**2007:**

Location	Hønefoss, E16
Road surface type	AC8
Test section length	240
Direction	Lane 1
Date	26.06.2007
Air temperature	22
Road temperature	32

Lane 1-Tyre A, 80 km/h, Hønefoss, E16, AC8,				
Total-average speed for dist. 0 - 240 m		79.9 km/h		
Std.dev.		0.10		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 240 m				
	98.5	98.2	98.6	98.3
Average for dist. 40 - 260 m				
			98.7	98.3
Std.dev.		0.12 0.18		

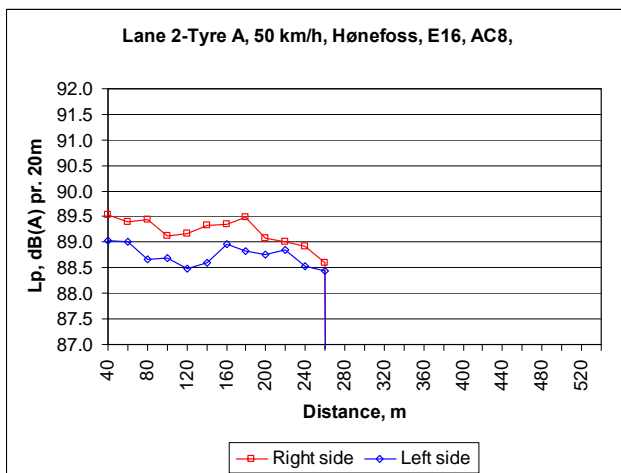
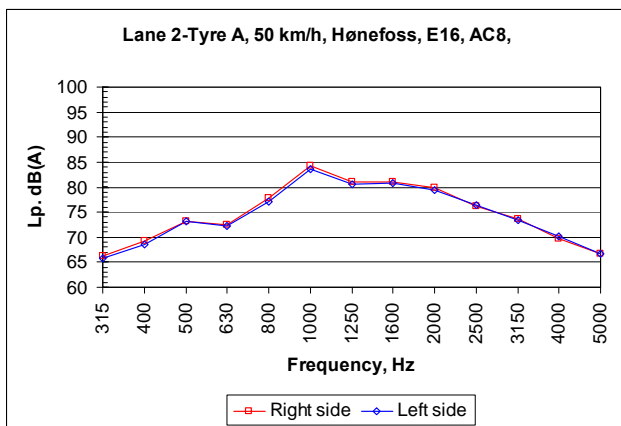


**Pavement 14: AC8. E16- Hønefoss, lane 2, 50 km/h**

**2005:**

Location	Hønefoss, E16	
Road surface type	AC8	
Test section length	280	
Direction	Lane 2 towards Hønefoss	
Date	21092005	
Air temperature		17
Road temperature		15

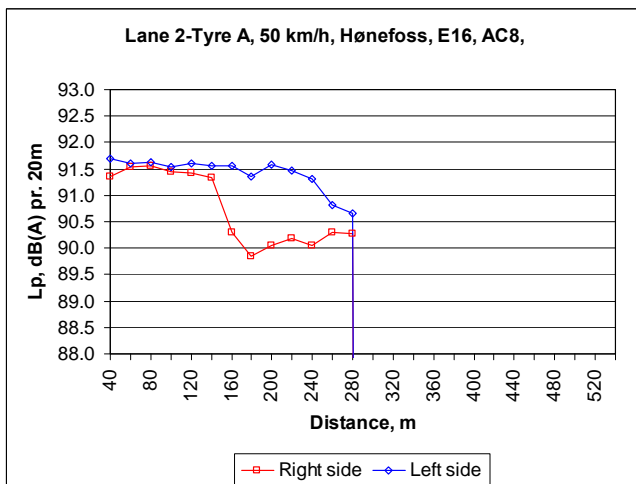
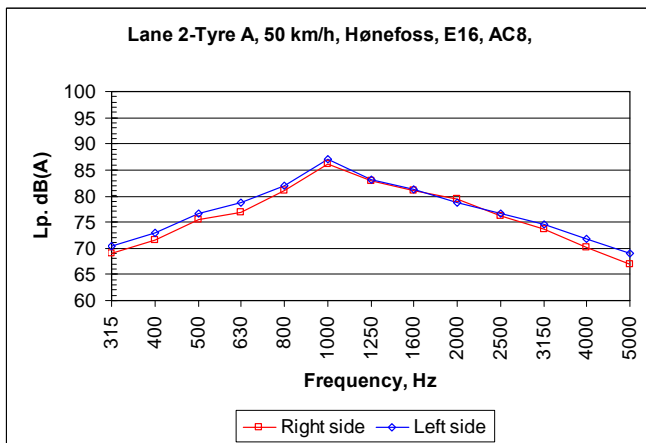
Lane 2-Tyre A, 50 km/h, Hønefoss, E16, AC8,				
Total-average speed for dist. 0 - 260 m		50.4 km/h		
Std.dev.		0.14		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 260 m			
	89.4	88.9	89.2	88.8
Average	for dist. 40 - 280 m		89.2	88.7
Std.dev.			0.27	0.20



**2006:**

Location	Hønefoss, E16	
Road surface type	AC8	
Test section length	280	
Direction	Lane 2 towards Hønefoss	
Date	280606	
Air temperature		17
Road temperature		21

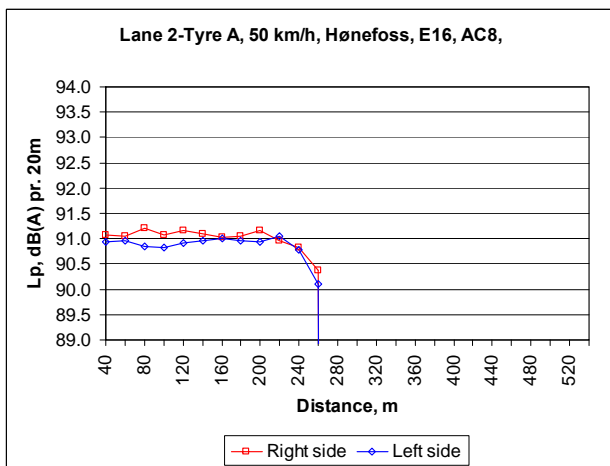
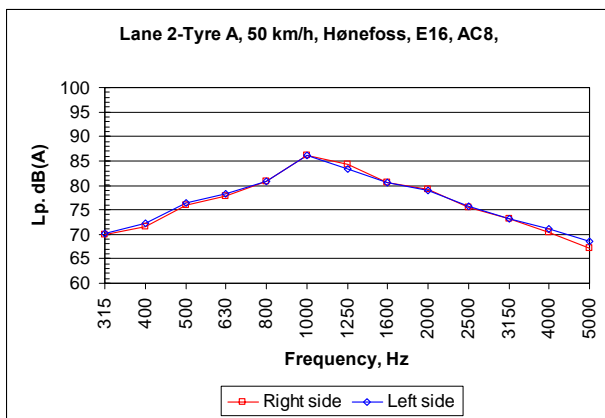
Lane 2-Tyre A, 50 km/h, Hønefoss, E16, AC8,				
Total-average speed for dist. 0 - 280 m		50.4 km/h		
Std.dev.		0.10		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 280 m			
	91.0	91.7	90.8	91.5
Average	for dist. 40 - 300 m		90.7	91.4
Std.dev.			0.69	0.32



2007:

Location	Hønefoss, E16
Road surface type	AC8
Test section length	260
Direction	Lane 2
Date	26.06.2007
Air temperature	22
Road temperature	32

Lane 2-Tyre A, 50 km/h, Hønefoss, E16, AC8,				
Total-average speed for dist. 0 - 280 m		50.9 km/h		
Std.dev.		0.19		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 280 m				
	90.9	90.7	91.0	90.9
Average for dist. 40 - 280 m				
Std.dev.			0.22	0.25

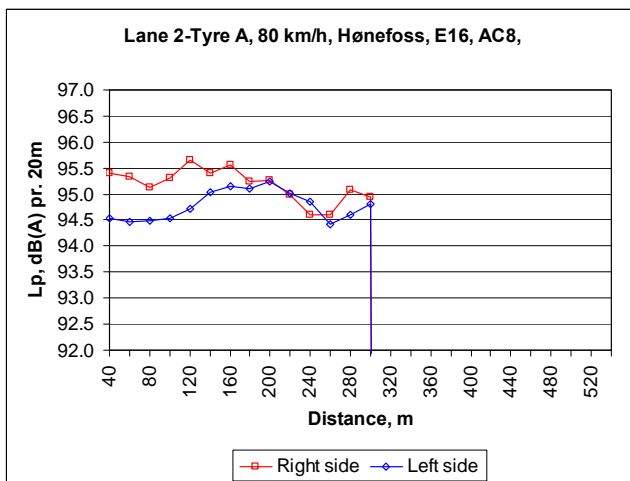
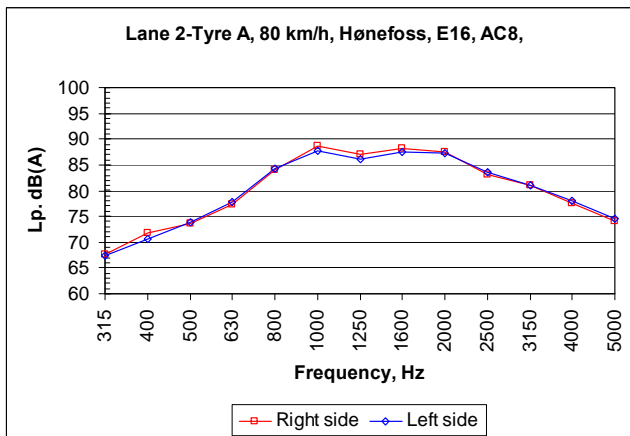


**Pavement 14: AC8. E16- Hønefoss, lane 2, 80 km/h**

2005:

Location	Hønefoss, E16
Road surface type	AC8
Test section length	300
Direction	Lane 2 towards Hønefoss
Date	21092005
Air temperature	17
Road temperature	15

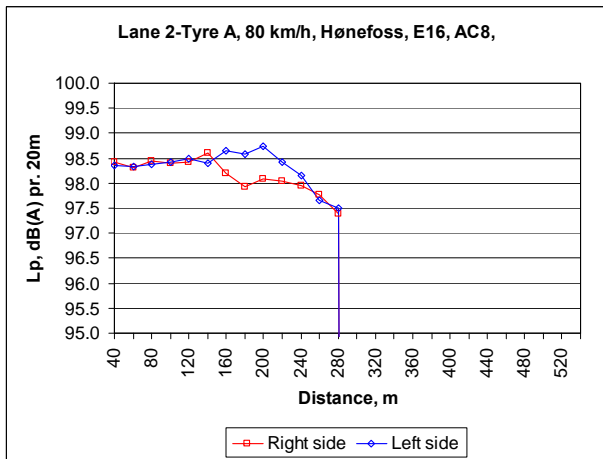
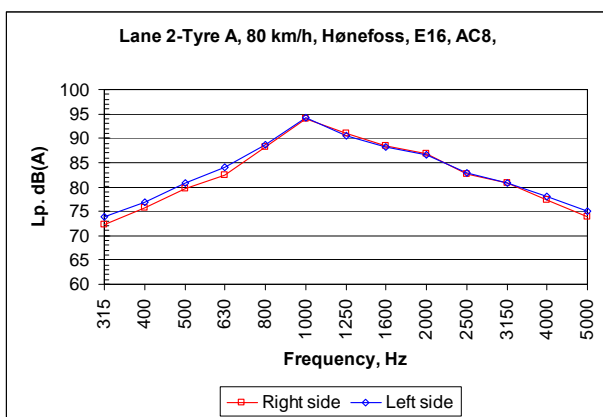
Lane 2-Tyre A, 80 km/h, Hønefoss, E16, AC8,				
Total-average speed for dist. 0 - 300 m		81.2 km/h		
Std.dev.		0.10		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 300 m				
	95.4	95.0	95.2	94.8
Average for dist. 40 - 320 m				
Std.dev.			0.32	0.28



**2006:**

Location	Hønefoss, E16
Road surface type	AC8
Test section length	280
Direction	Lane 2 towards Hønefoss
Date	280606
Air temperature	17
Road temperature	21

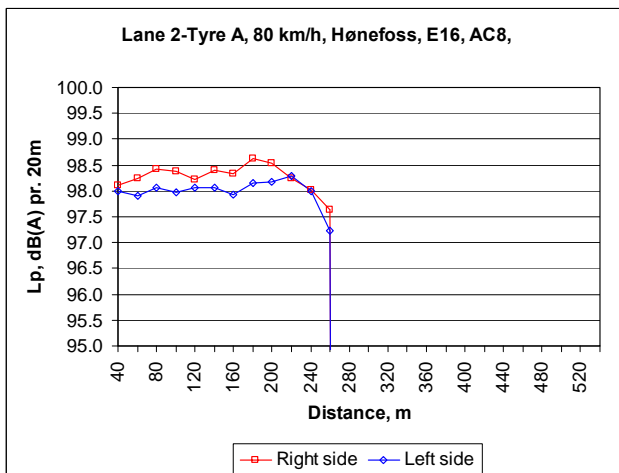
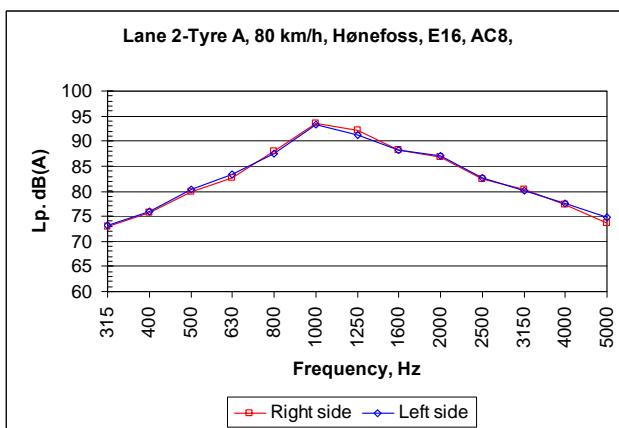
Lane 2-Tyre A, 80 km/h, Hønefoss, E16, AC8,				
Total-average speed for dist. 0 - 280 m		80.5 km/h		
Std.dev.		0.13		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 280 m				
	98.4	98.6	98.2	98.4
Average for dist. 40 - 300 m				
			98.2	98.3
Std.dev.				
			0.33	0.36



**2007:**

Location	Hønefoss, E16
Road surface type	AC8
Test section length	260
Direction	Lane 2
Date	26.06.2007
Air temperature	22
Road temperature	32

Lane 2-Tyre A, 80 km/h, Hønefoss, E16, AC8,				
Total-average speed for dist. 0 - 280 m		79.9 km/h		
Std.dev.		0.15		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 280 m				
	98.1	97.9	98.3	98.0
Average for dist. 40 - 280 m				
			98.3	98.0
Std.dev.				
			0.26	0.26



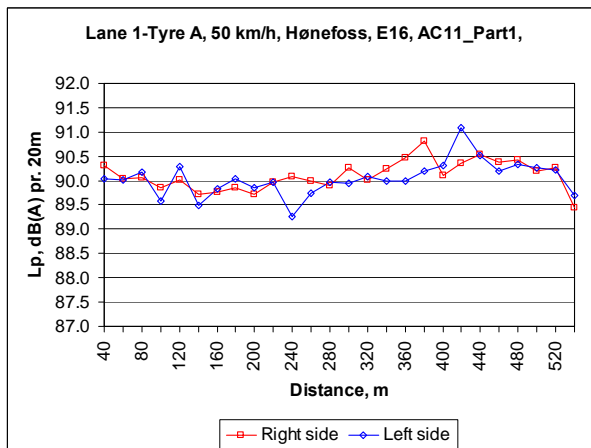
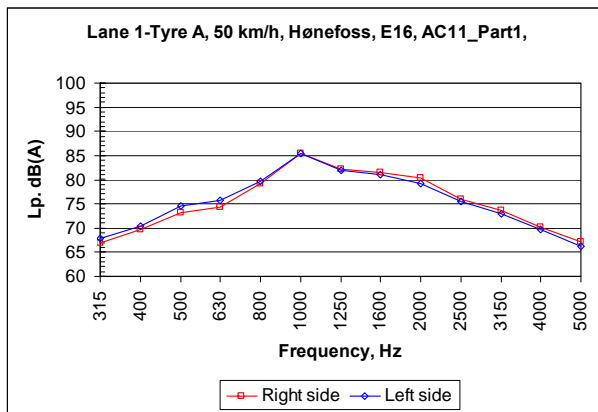


**Pavement 15: AC11. E16- Hønefoss, lane 1, 50 km/h**

**2005:**

Location	Hønefoss, E16
Road surface type	AC11_Part1
Test section length	540
Direction	Lane1 towards Nes
Date	21092005
Air temperature	17
Road temperature	15

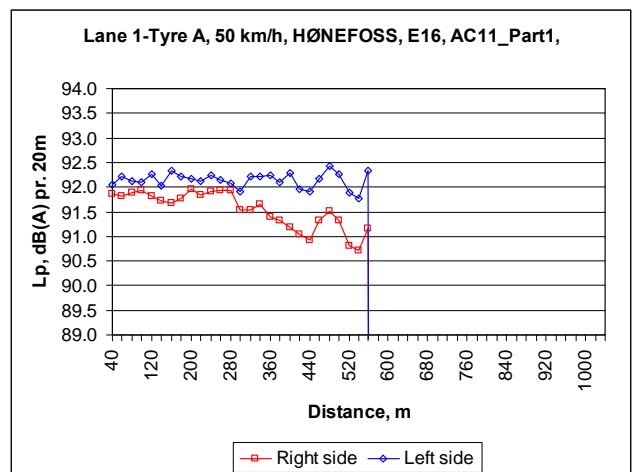
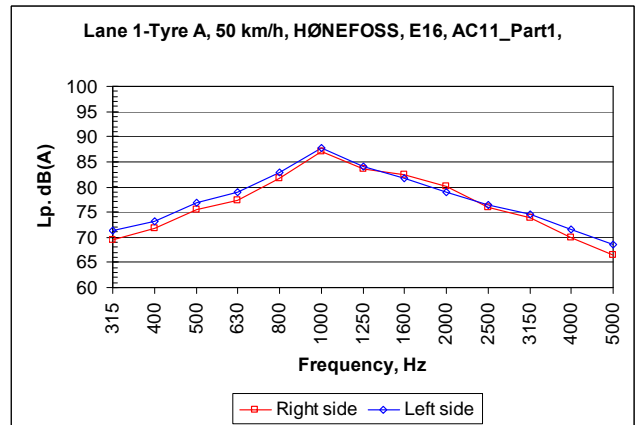
Lane 1-Tyre A, 50 km/h, Hønefoss, E16, AC11_Part1,				
Total-average speed for dist. 0 - 540 m		50.6 km/h		
Std.dev.		0.86		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 540 m			
	90.3	90.2	90.1	90.0
Average	for dist. 40 - 560 m			
Std.dev.			0.30	0.36



**2006:**

Location	HØNEFOSS, E16
Road surface type	AC11_Part1
Test section length	560
Direction	Lane 1
Date	280606
Air temperature	17
Road temperature	21

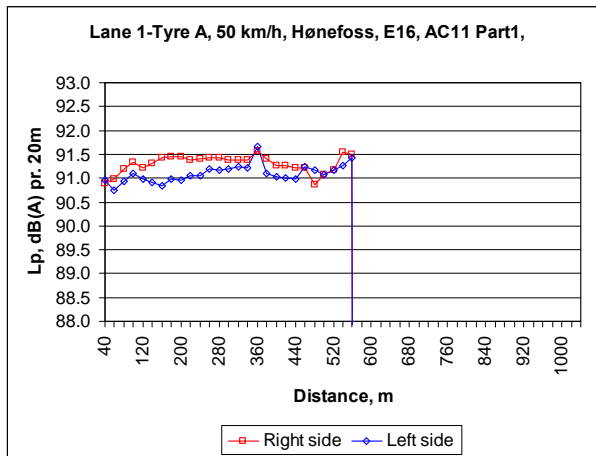
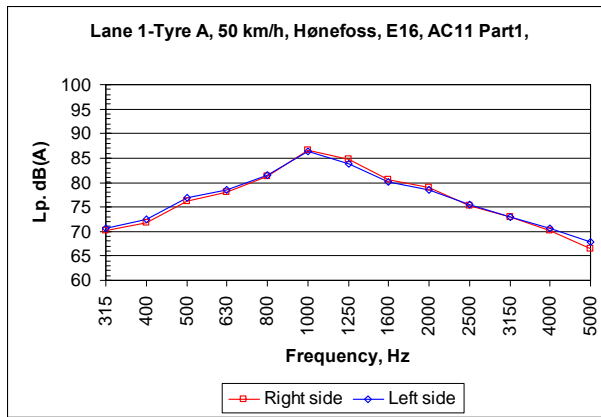
Lane 1-Tyre A, 50 km/h, HØNEFOSS, E16, AC11_Part1,				
Total-average speed for dist. 0 - 560 m		50.8 km/h		
Std.dev.		0.49		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 560 m			
	91.8	92.4	91.6	92.2
Average	for dist. 40 - 580 m			
Std.dev.			0.37	0.15



2007:

Location	Hønefoss, E16
Road surface type	AC11 Part1
Test section length	560
Direction	Lane 1
Date	26.06.2007
Air temperature	22
Road temperature	32

Lane 1-Tyre A, 50 km/h, Hønefoss, E16, AC11 Part1,				
Total-average speed for dist. 0 - 560 m		50.9 km/h		
Std.dev.		0.17		
dBA / Distance	Air temp 22	Temp.corr. to +20C		
	Right s	Left s	Right side	Left side
<k for dist. 0 - 560 m				
	91.2	91.0	91.3	91.1
Average for dist. 40 - 580 m			91.3	91.1
Std.dev.			0.19	0.18

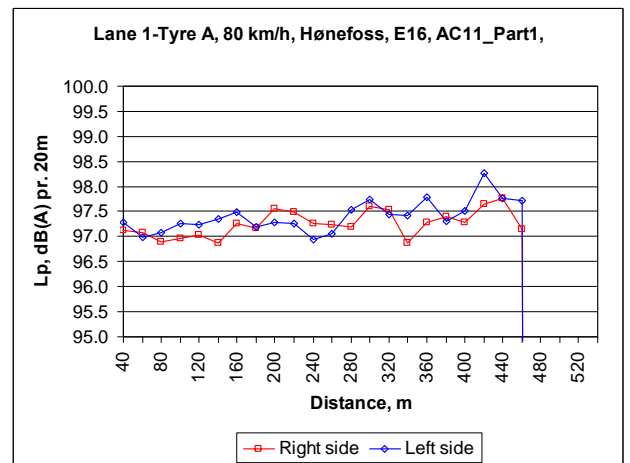
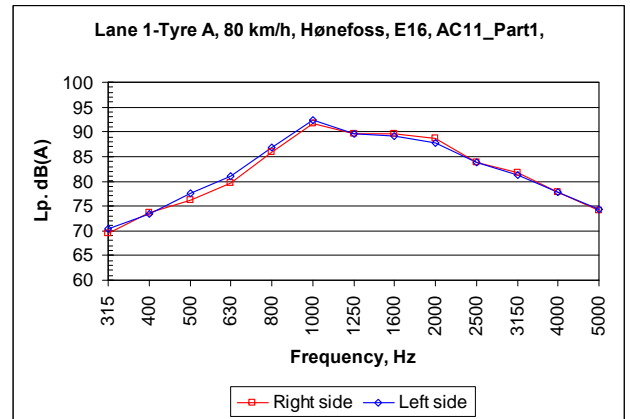


**Pavement 15: AC11. E16- Hønefoss, lane 1, 80 km/h**

2005:

Location	Hønefoss, E16
Road surface type	AC11_Part1
Test section length	480
Direction	Lane 1 towards Nes
Date	21092005
Air temperature	17
Road temperature	15

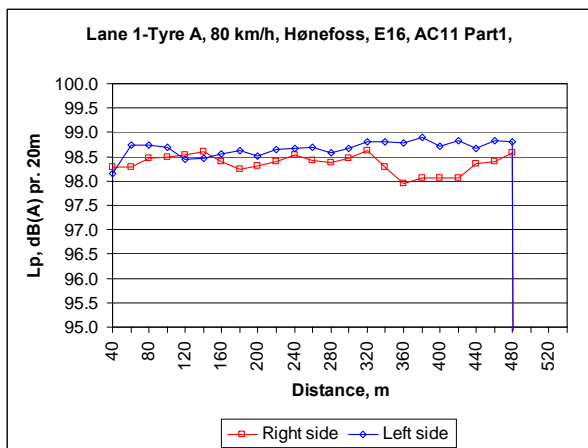
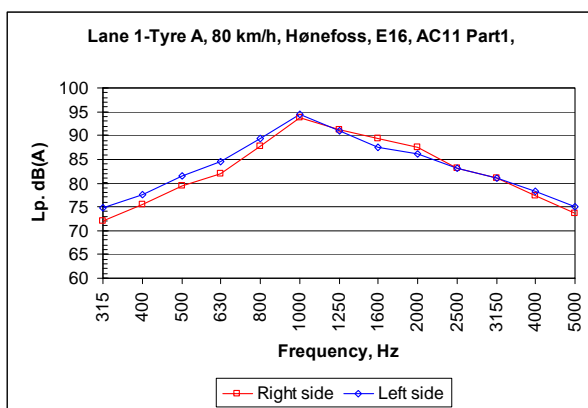
Lane 1-Tyre A, 80 km/h, Hønefoss, E16, AC11_Part1,				
Total-average speed for dist. 0 - 460 m		79.9 km/h		
Std.dev.		1.10		
dBA / Distance	Air temp 17	Temp.corr. to +20C		
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 460 m			97.2	97.4
Average for dist. 40 - 480 m			97.3	97.4
Std.dev.			0.26	0.31



**2006:**

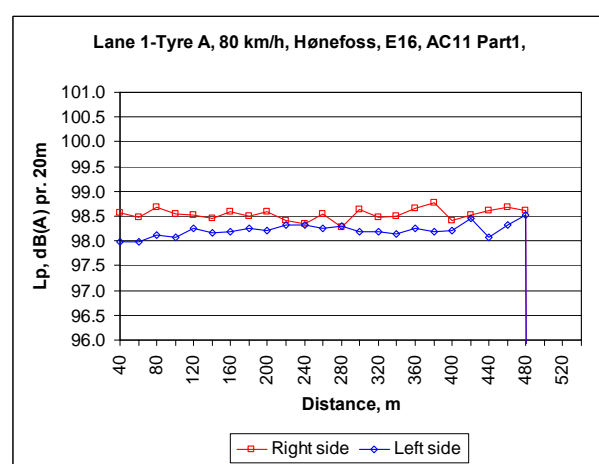
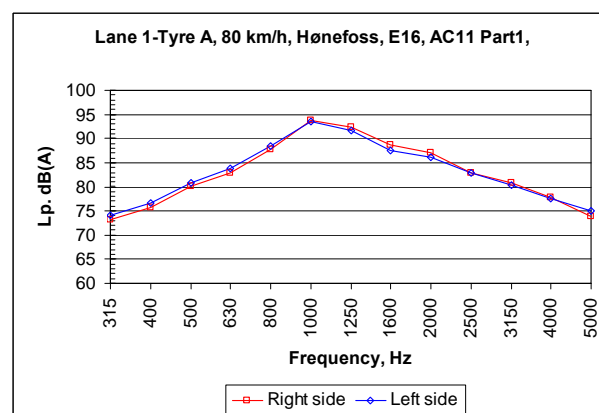
Location	Hønefoss, E16
Road surface type	AC11 Part1
Test section length	480
Direction	Lane 1
Date	280606
Air temperature	17
Road temperature	21

Lane 1-Tyre A, 80 km/h, Hønefoss, E16, AC11 Part1,				
Total-average speed for dist. 0 - 480 m		80.7 km/h		
Std.dev.		0.78		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 480 m				
	98.5	98.8	98.3	98.6
Average for dist. 40 - 500 m				
			98.4	98.7
Std.dev.				
			0.18	0.17


**2007:**

Location	Hønefoss, E16
Road surface type	AC11 Part1
Test section length	480
Direction	Lane 1
Date	26.06.2007
Air temperature	22
Road temperature	32

Lane 1-Tyre A, 80 km/h, Hønefoss, E16, AC11 Part1,				
Total-average speed for dist. 0 - 480 m		79.9 km/h		
Std.dev.		0.83		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 480 m				
	98.4	98.1	98.5	98.2
Average for dist. 40 - 500 m				
			98.5	98.2
Std.dev.				
			0.11	0.13

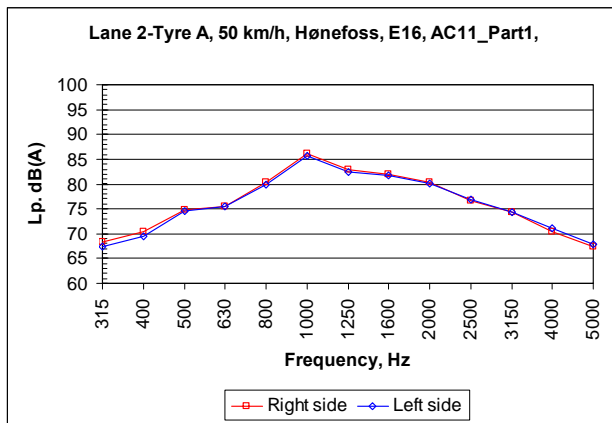


**Pavement 15: AC11. E16- Hønefoss, lane 2, 50 km/h**

**2005:**

Location	Hønefoss, E16		
Road surface type	AC11_Part1		
Test section length	460		
Direction	Lane 2 towards Hønefoss		
Date	21092005		
Air temperature			17
Road temperature			15

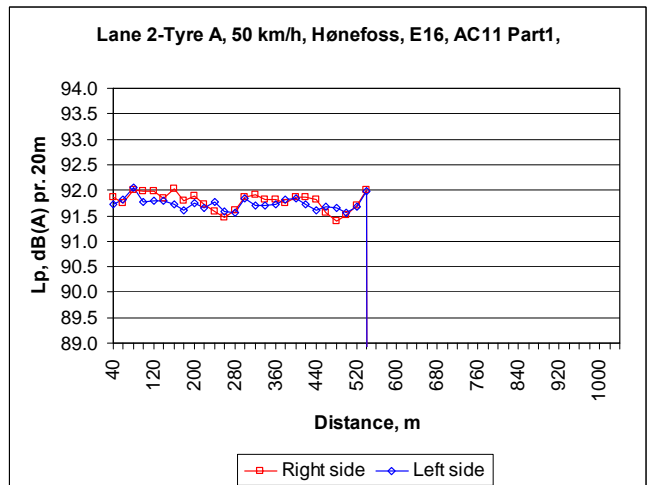
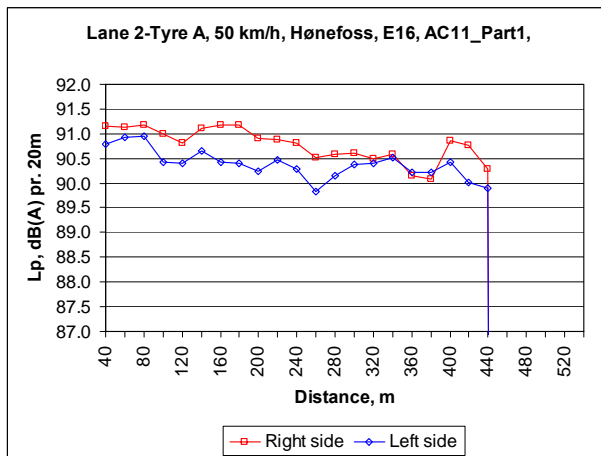
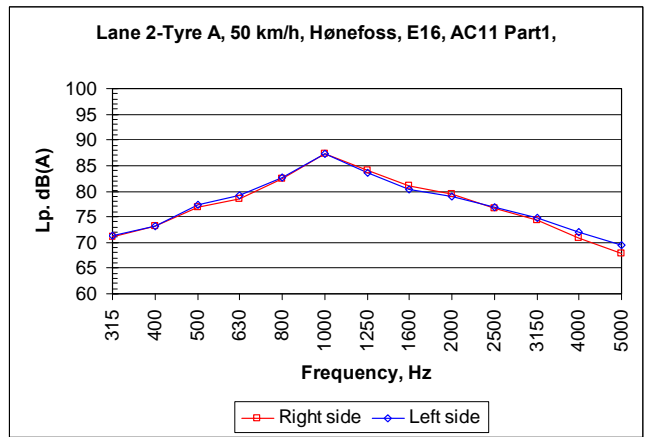
Lane 2-Tyre A, 50 km/h, Hønefoss, E16, AC11_Part1,				
Total-average speed for dist. 0 - 440 m		49.8 km/h		
Std.dev.		0.87		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 440 m				
	90.9	90.6	90.8	90.4
Average for dist. 40 - 460 m			90.8	90.4
Std.dev.			0.34	0.29



**2006:**

Location	Hønefoss, E16		
Road surface type	AC11 Part1		
Test section length	540		
Direction	Lane 2		
Date	280606		
Air temperature			17
Road temperature			21

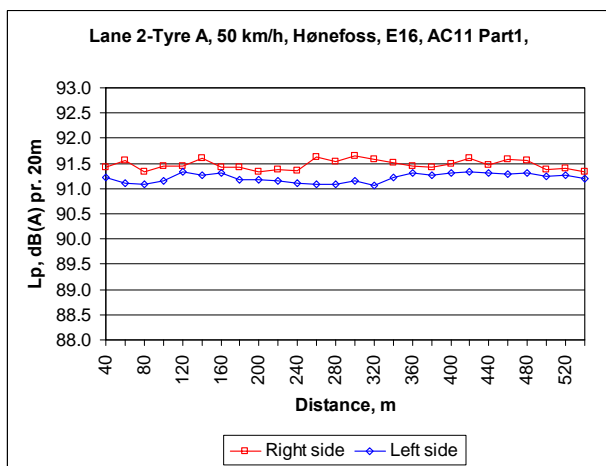
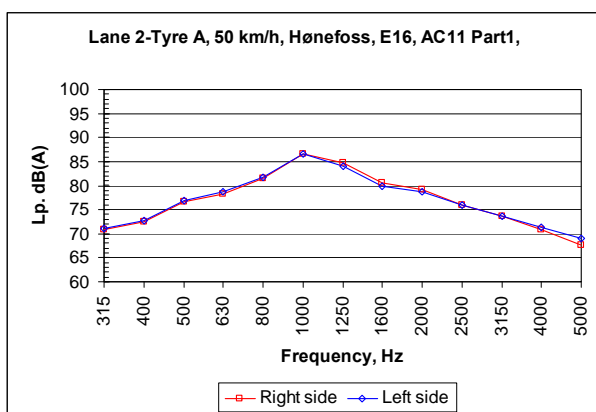
Lane 2-Tyre A, 50 km/h, Hønefoss, E16, AC11 Part1,				
Total-average speed for dist. 0 - 540 m		50.4 km/h		
Std.dev.		0.14		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 540 m				
	92.0	91.9	91.8	91.7
Average for dist. 40 - 560 m			91.8	91.7
Std.dev.			0.18	0.12



**2007:**

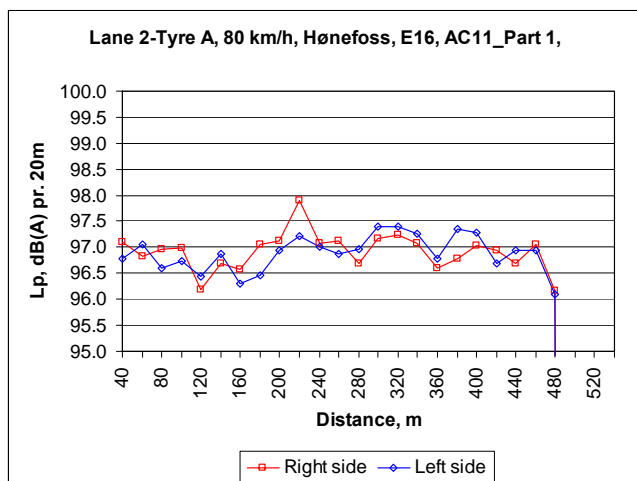
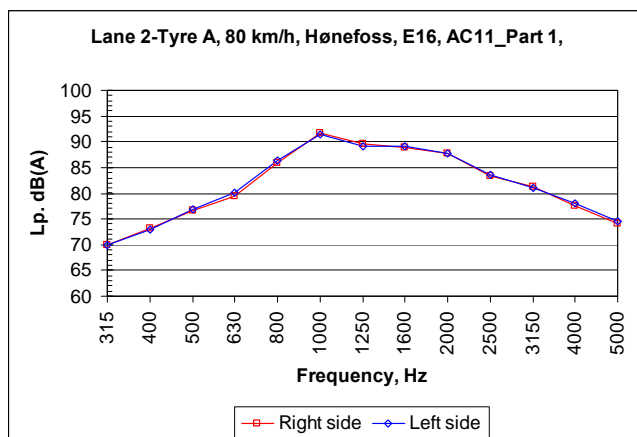
Location	Hønefoss, E16
Road surface type	AC11 Part1
Test section length	540
Direction	Lane 2
Date	26.06.2007
Air temperature	22
Road temperature	32

Lane 2-Tyre A, 50 km/h, Hønefoss, E16, AC11 Part1,				
Total-average speed for dist. 0 - 540 m		51.0 km/h		
Std.dev.		0.11		
dB(A) / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 540 m				
	91.3	91.0	91.4	91.2
Average for dist. 40 - 560 m			91.5	91.2
Std.dev.			0.10	0.09


**Pavement 15: AC11. E16- Hønefoss, lane 2, 80 km/h**
**2005:**

Location	Hønefoss, E16
Road surface type	AC11_Part 1
Test section length	520
Direction	Lane 2 towards Hønefoss
Date	21092005
Air temperature	17
Road temperature	15

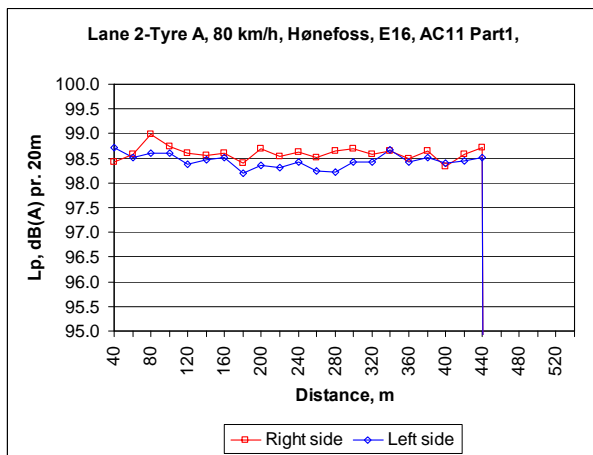
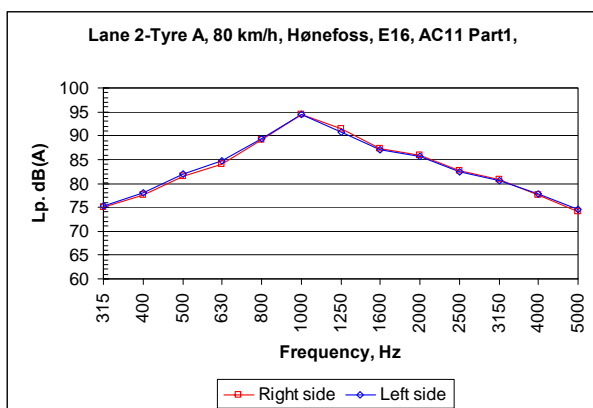
Lane 2-Tyre A, 80 km/h, Hønefoss, E16, AC11_Part 1,				
Total-average speed for dist. 0 - 480 m		80.9 km/h		
Std.dev.		0.52		
dB(A) / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 480 m			97.1	97.1
Average for dist. 40 - 500 m			96.9	96.9
Std.dev.			0.36	0.35



**2006:**

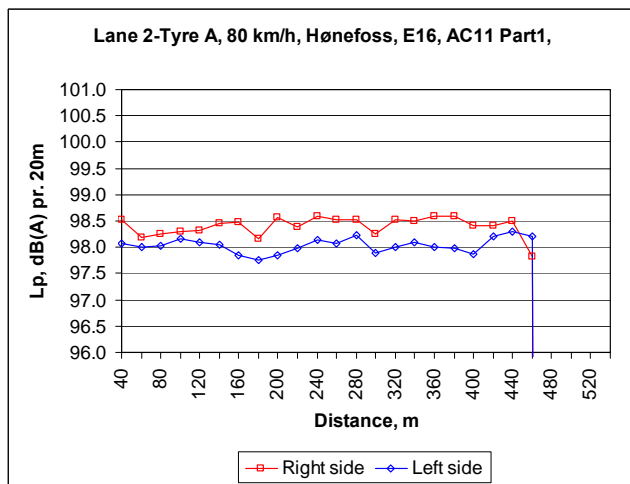
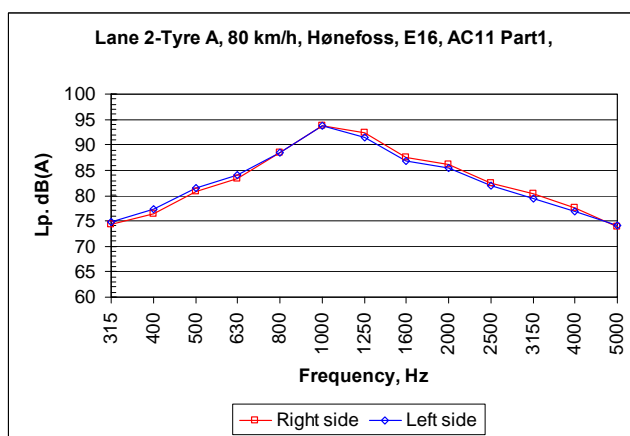
Location	Hønefoss, E16
Road surface type	AC11 Part1
Test section length	440
Direction	Lane 2
Date	280606
Air temperature	17
Road temperature	21

Lane 2-Tyre A, 80 km/h, Hønefoss, E16, AC11 Part1,				
Total-average speed for dist. 0 - 440 m		80.4 km/h		
Std.dev.		0.12		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 440 m	98.7	98.6	98.6	98.4
Average for dist. 40 - 460 m			98.6	98.4
Std.dev.			0.14	0.14


**2007:**

Location	Hønefoss, E16
Road surface type	AC11 Part1
Test section length	460
Direction	Lane 2
Date	26.06.2007
Air temperature	22
Road temperature	32

Lane 2-Tyre A, 80 km/h, Hønefoss, E16, AC11 Part1,				
Total-average speed for dist. 0 - 460 m		79.9 km/h		
Std.dev.		0.15		
dBA / Distance	Air temp	22	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 460 m	<k		98.4	98.0
	98.3	97.9		
Average for dist. 40 - 480 m			98.4	98.0
Std.dev.			0.18	0.14

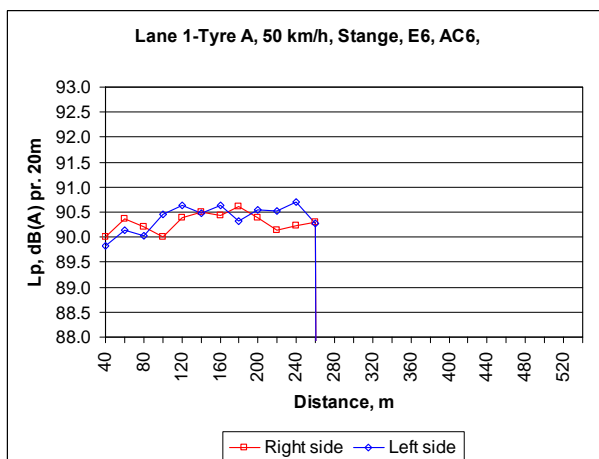
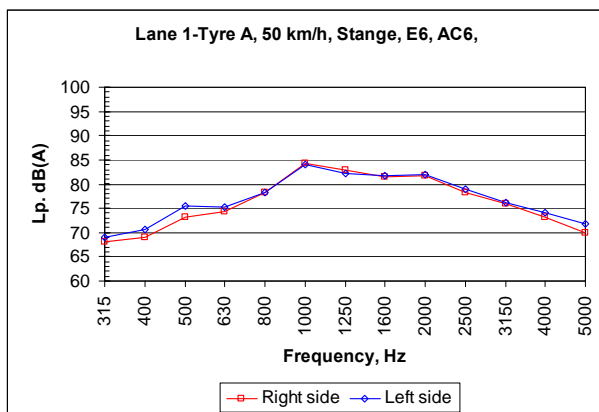


**Pavement 16: AC6. E6- Stange, lane 1, 50 km/h**

2007:

Location	Stange, E6
Road surface type	AC6
Test section length	260
Direction	Lane 1
Date	26.06.2007
Air temperature	21
Road temperature	26

Lane 1-Tyre A, 50 km/h, Stange, E6, AC6,				
Total-average speed for dist. 0 - 280 m		51.3 km/h		
Std.dev.		2.72		
dBA / Distance	Air temp	21	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 280 m				
	90.2	90.2	90.3	90.3
Average for dist. 40 - 280 m				
			90.3	90.4
Std.dev.				
			0.19	0.27

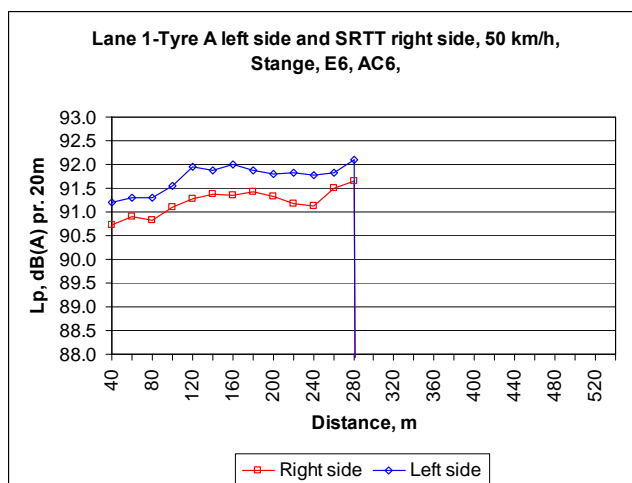
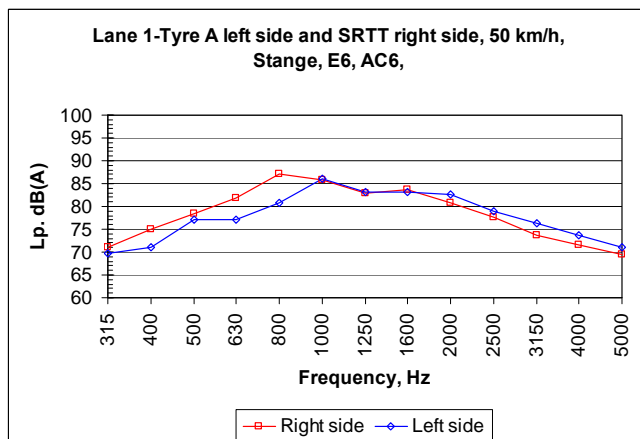


2008:

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Stange, E6
Road surface type	AC6
Test section length	280
Direction	Lane 1 towards Hamar
Date	25.06.2008
Air temperature	17
Road temperature	21

Lane 1-Tyre A left side and SRTT right side, 50 km/h, Stange, E6, AC6,				
Total-average speed for dist. 0 - 280 m		51.4 km/h		
Std.dev.		1.01		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 280 m				
	91.3	91.8	91.1	91.6
Average for dist. 40 - 300 m				
			91.2	91.7
Std.dev.				
			0.27	0.29

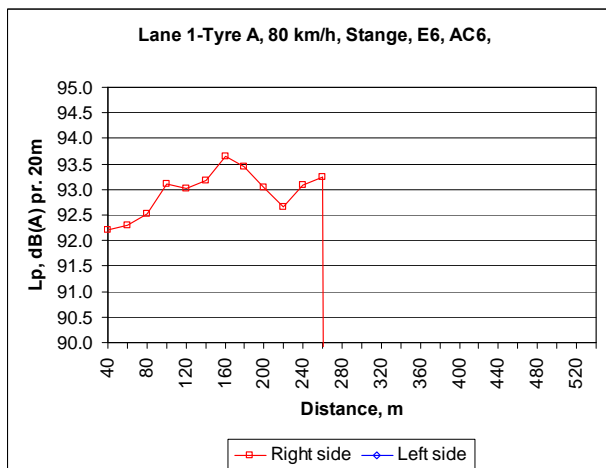
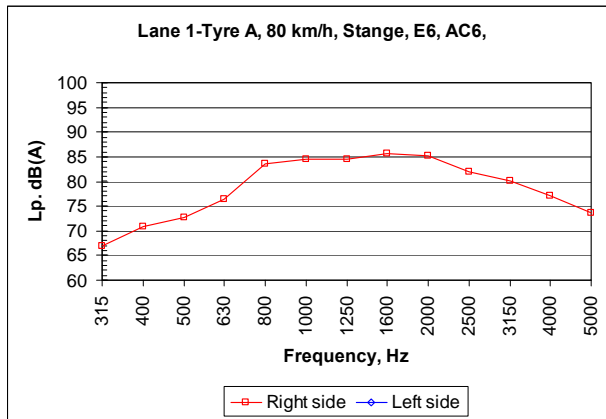


**Pavement 16: AC6. E6- Stange, lane 1, 80 km/h**

**2005:**

Location	Stange, E6
Road surface type	AC6
Test section length	270
Direction	Lane 1 towards Hamar
Date	19092005
Air temperature	17
Road temperature	17

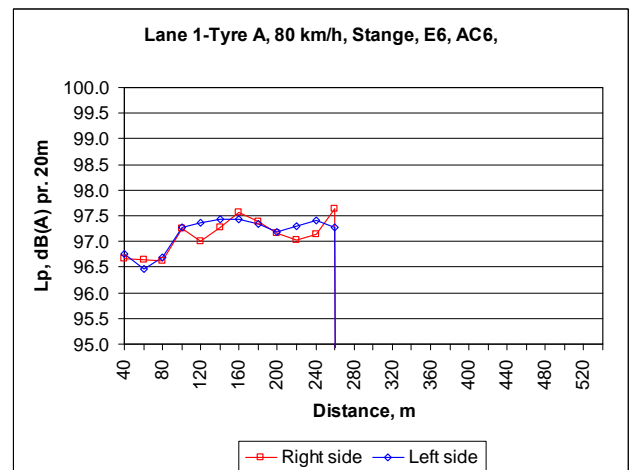
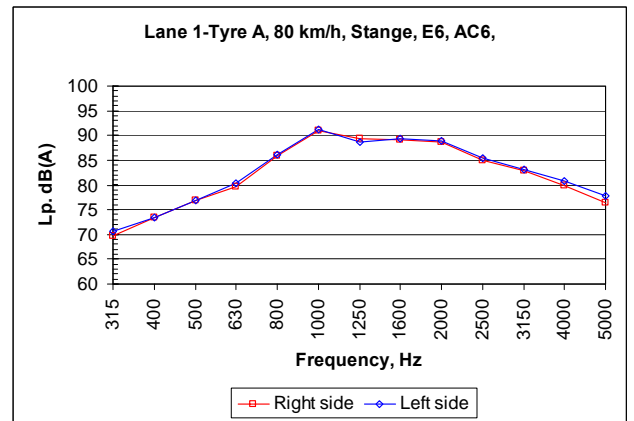
Lane 1-Tyre A, 80 km/h, Stange, E6, AC6,				
Total-average speed for dist. 0 - 260 m		81.1 km/h		
Std.dev.		0.32		
dB(A) / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 260 m	93.1	52.3	92.9	52.2
Average for dist. 40 - 280 m			93.0	52.1
Std.dev.			0.45	0.36



**2006:**

Location	Stange, E6
Road surface type	AC6
Test section length	260
Direction	Lane 1
Date	260606
Air temperature	20
Road temperature	21

Lane 1-Tyre A, 80 km/h, Stange, E6, AC6,				
Total-average speed for dist. 0 - 260 m		80.1 km/h		
Std.dev.		0.40		
dB(A) / Distance	Air temp	20	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 260 m	97.1	97.1	97.1	97.1
Average for dist. 40 - 280 m			97.1	97.2
Std.dev.			0.34	0.33

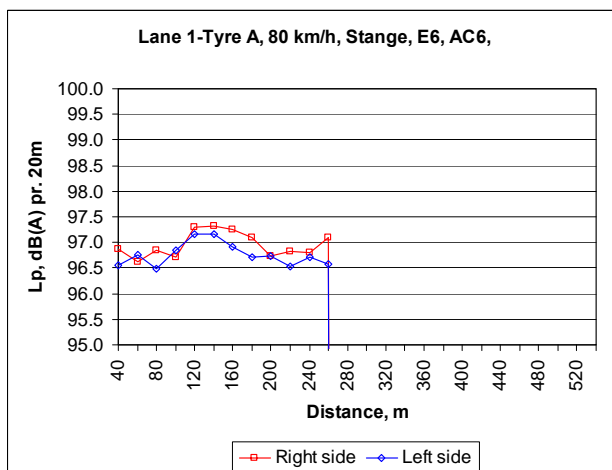
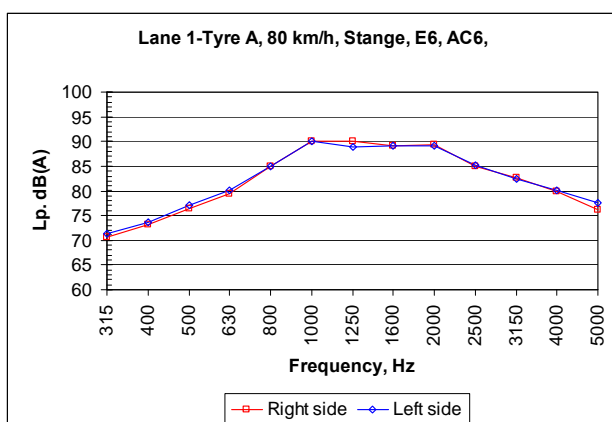




**2007:**

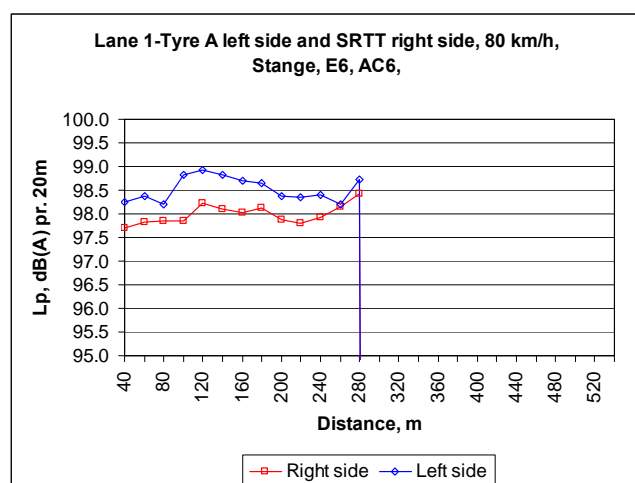
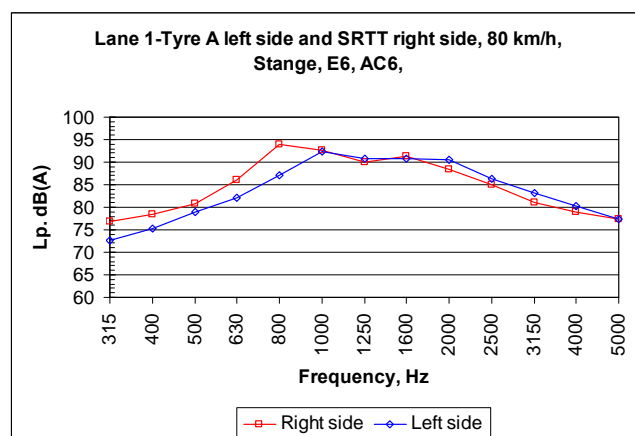
Location	Stange, E6
Road surface type	AC6
Test section length	260
Direction	Lane 1
Date	26.06.2007
Air temperature	21
Road temperature	26

Lane 1-Tyre A, 80 km/h, Stange, E6, AC6,				
Total-average speed for dist. 0 - 260 m		81.2 km/h		
Std.dev.		0.36		
dBA / Distance	Air temp Right s	21 Left s	Temp.corr. to +20C Right side	Left side
<k for dist. 0 - 260 m				
	96.9	96.7	96.9	96.7
Average for dist. 40 - 280 m		97.0 96.8		
Std.dev.		0.24 0.22		


**2008:**
*(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)*

Location	Stange, E6
Road surface type	AC6
Test section length	280
Direction	Lane 1 towards Hamar
Date	25.06.2008
Air temperature	17
Road temperature	21

Lane 1-Tyre A left side and SRTT right side, 80 km/h, Stange, E6, AC6,				
Total-average speed for dist. 0 - 280 m		79.5 km/h		
Std.dev.		0.77		
dBA / Distance	Air temp Right s	17 Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 280 m				
	98.1	98.6	97.9	98.4
Average for dist. 40 - 300 m		98.0 98.5		
Std.dev.		0.21 0.26		

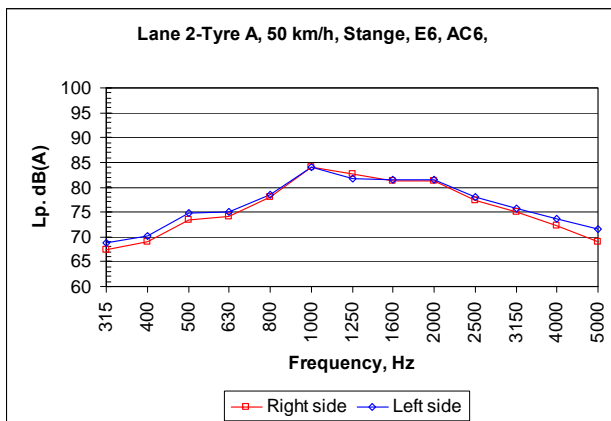


**Pavement 16: AC6. E6- Stange, lane 2, 50 km/h**

**2007:**

Location	Stange, E6
Road surface type	AC6
Test section length	260
Direction	Lane 2
Date	26.06.2007
Air temperature	21
Road temperature	26

Lane 2-Tyre A, 50 km/h, Stange, E6, AC6,				
Total-average speed for dist. 0 - 260 m		50.6 km/h		
Std.dev.		0.17		
dBA / Distance	Air temp 21	Temp.corr. to +20C		
	Right s	Left s	Right side	Left side
<k for dist. 0 - 260 m				
	89.9	90.0	89.9	90.1
Average for dist. 40 - 280 m				
			89.9	90.0
Std.dev.				
			0.11	0.20

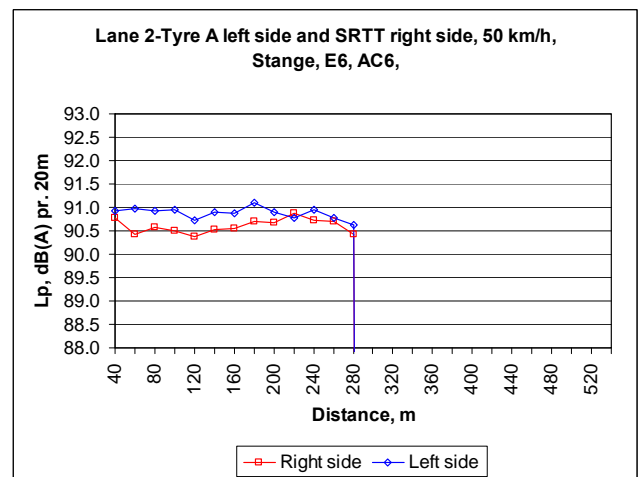
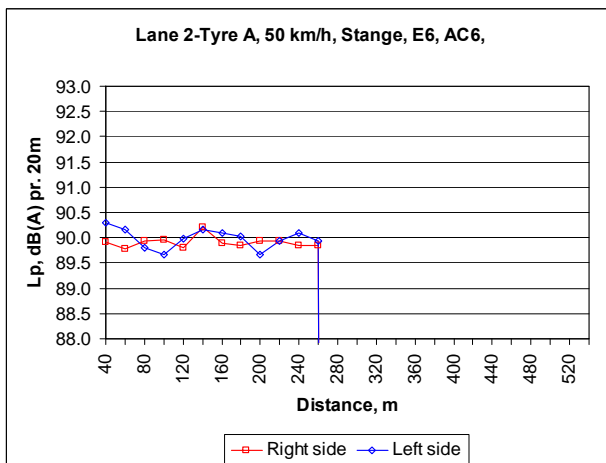
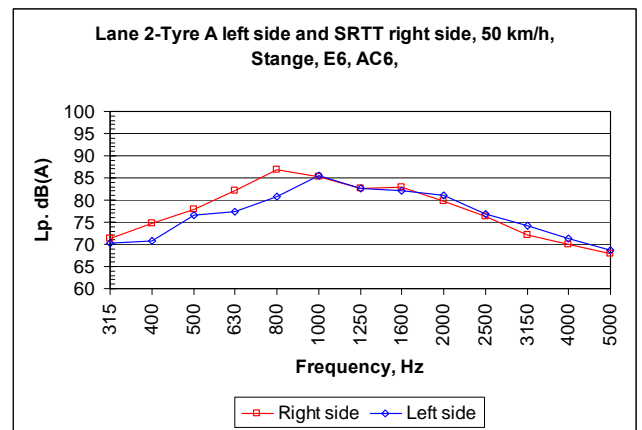


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Stange, E6
Road surface type	AC6
Test section length	280
Direction	Lane 2 towards Oslo
Date	25.06.2008
Air temperature	17
Road temperature	21

Lane 2-Tyre A left side and SRTT right side, 50 km/h, Stange, E6, AC6,				
Total-average speed for dist. 0 - 280 m		53.4 km/h		
Std.dev.		0.34		
dBA / Distance	Air temp 17	Temp.corr. to +20C		
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 280 m				
	90.8	91.1	90.6	90.9
Average for dist. 40 - 300 m				
			90.6	90.9
Std.dev.				
			0.15	0.12

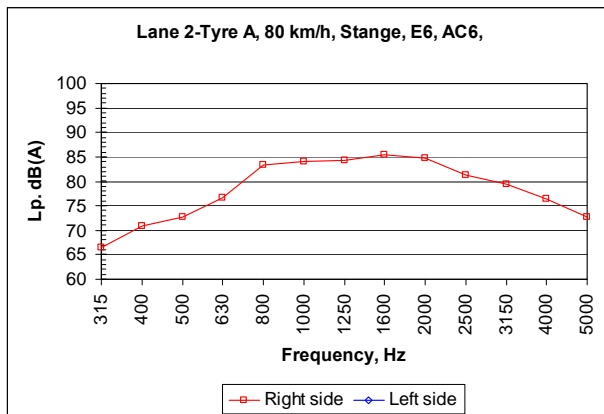


**Pavement 16: AC6. E6- Stange, lane 2, 80 km/h**

**2005:**

Location	Stange, E6
Road surface type	AC6
Test section length	280
Direction	Lane 2 towards Oslo
Date	19092005
Air temperature	17
Road temperature	17

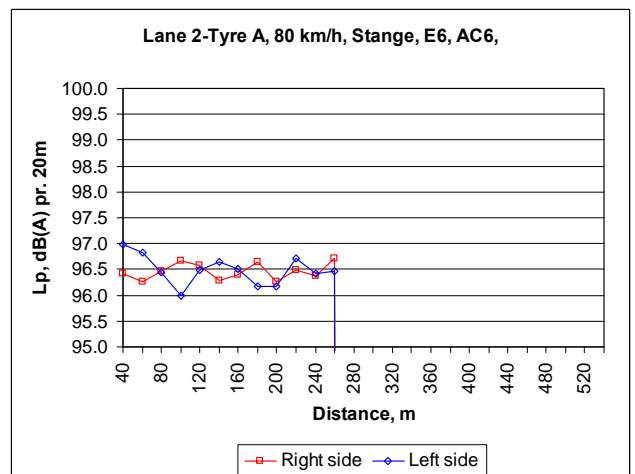
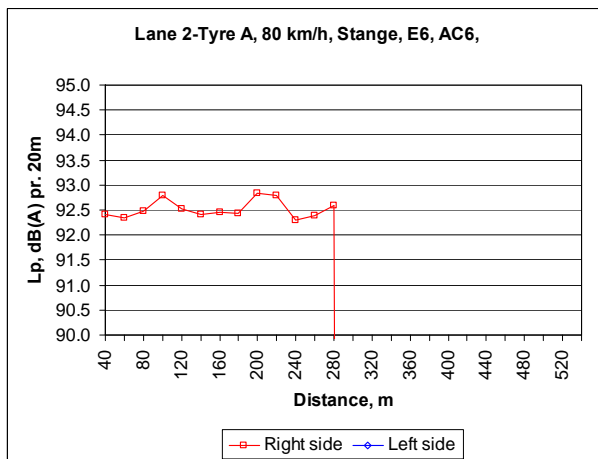
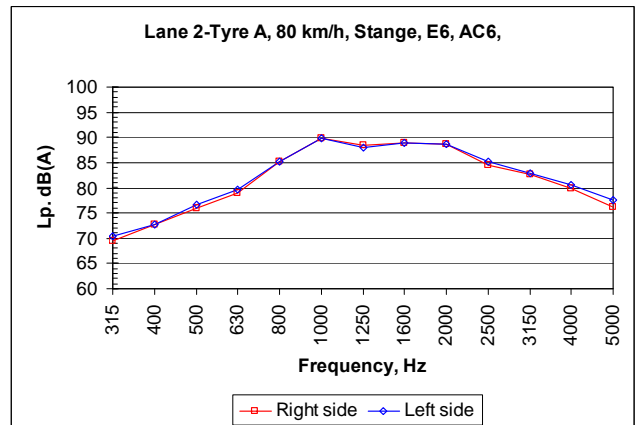
Lane 2-Tyre A, 80 km/h, Stange, E6, AC6,				
Total-average speed for dist. 0 - 280 m		81.1 km/h		
Std.dev.		0.26		
dBA / Distance	Air temp Right s	Left s	Temp.corr. to +20C	
			Right side	Left side
Total-average for dist. 0 - 280 m			92.6	51.9
		92.8	52.1	
Average for dist. 40 - 300 m			92.5	51.9
Std.dev.			0.18	0.31



**2006:**

Location	Stange, E6
Road surface type	AC6
Test section length	260
Direction	Lane 2
Date	260606
Air temperature	20
Road temperature	21

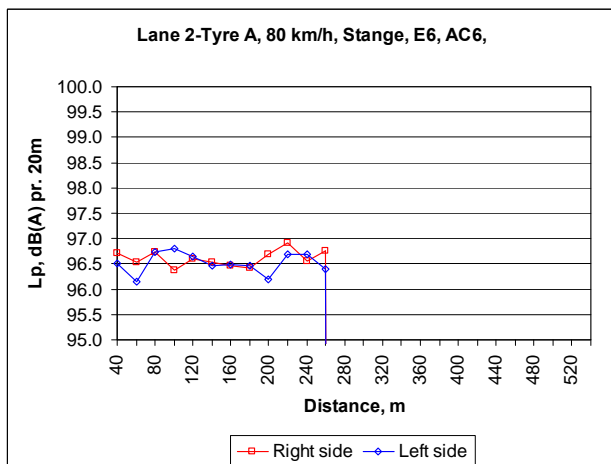
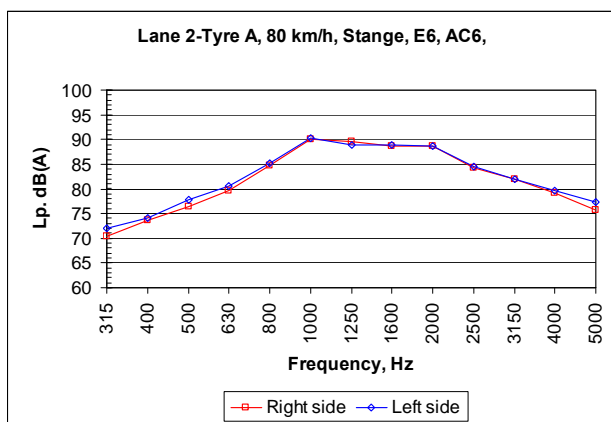
Lane 2-Tyre A, 80 km/h, Stange, E6, AC6,				
Total-average speed for dist. 0 - 260 m		80.1 km/h		
Std.dev.		0.33		
dBA / Distance	Air temp Right s	Left s	Temp.corr. to +20C	
			Right side	Left side
Total-average for dist. 0 - 260 m			96.5	96.6
		96.5	96.6	
Average for dist. 40 - 280 m			96.5	96.5
Std.dev.			0.16	0.28



**2007:**

Location	Stange, E6
Road surface type	AC6
Test section length	260
Direction	Lane 2
Date	26.06.2007
Air temperature	21
Road temperature	26

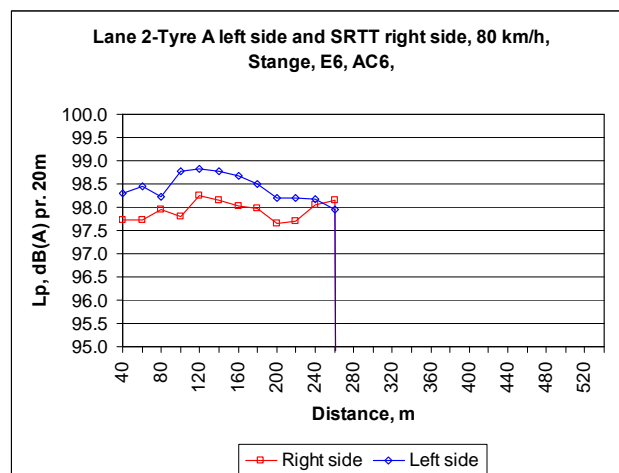
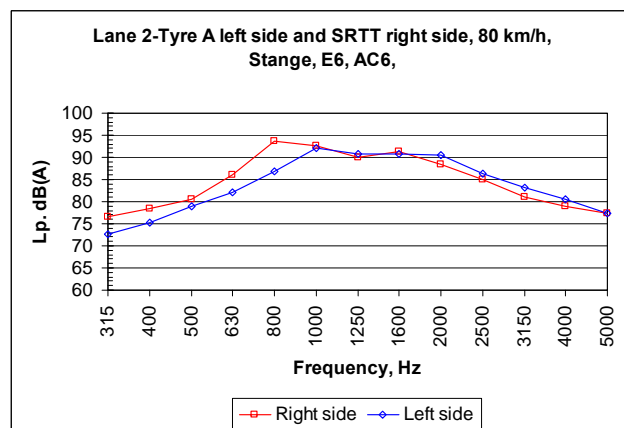
Lane 2-Tyre A, 80 km/h, Stange, E6, AC6,			
Total-average speed	for dist. 0 - 260 m	81.3	km/h
Std.dev.		0.26	
dBA / Distance	Air temp	21	Temp.corr. to +20C
	Right s	Left s	Right side
			Left side
<k for dist. 0 - 260 m			
	96.6	96.5	96.6
Average	for dist. 40 - 280 m		96.5
Std.dev.			0.20


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Stange, E6
Road surface type	AC6
Test section length	260
Direction	Lane 2 towards Oslo
Date	25.06.2008
Air temperature	17
Road temperature	21

Lane 2-Tyre A left side and SRTT right side, 80 km/h, Stange, E6, AC6,			
Total-average speed	for dist. 0 - 260 m	79.2	km/h
Std.dev.		0.82	
dBA / Distance	Air temp	17	Temp.corr. to +20C
	Right s	Left s	Right side
			Left side
Total-average for dist. 0 - 260 m			
	98.0	98.5	97.9
Average	for dist. 40 - 280 m		98.4
Std.dev.			0.29

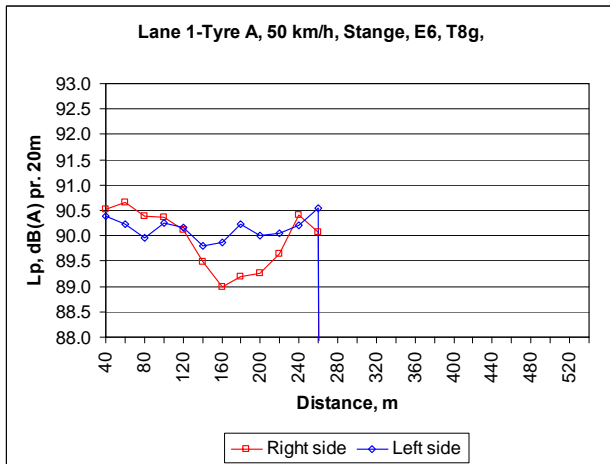
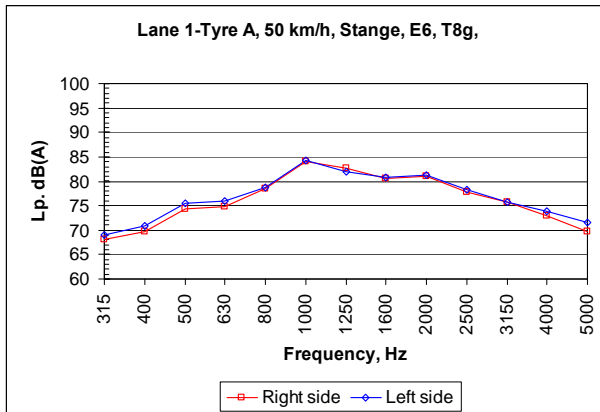


**Pavement 17: T8g. E6- Stange, lane 1, 50 km/h**

2007:

Location	Stange, E6
Road surface type	T8g
Test section length	260
Direction	Lane 1
Date	26.06.2007
Air temperature	21
Road temperature	26

Lane 1-Tyre A, 50 km/h, Stange, E6, T8g,				
Total-average speed for dist. 0 - 260 m		51.5 km/h		
Std.dev.		1.28		
dBA / Distance	Air temp	21	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 260 m				
	89.9	90.1	90.0	90.1
Average for dist. 40 - 280 m				
			89.9	90.1
Std.dev.				
			0.58	0.22

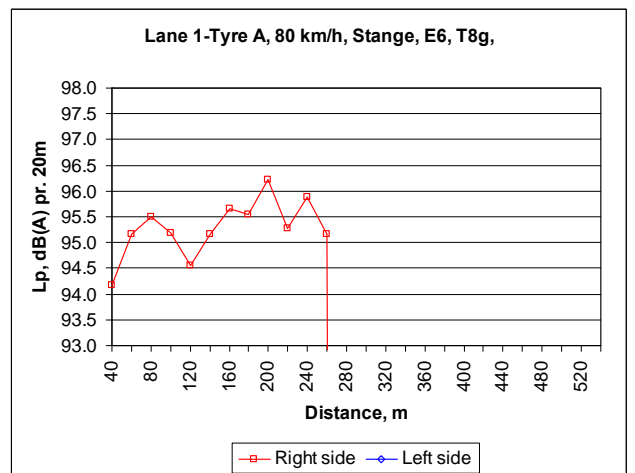
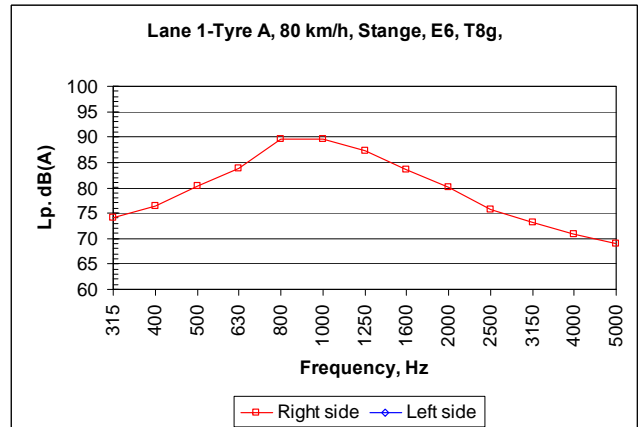


**Pavement 17: T8g. E6- Stange, lane 1, 80 km/h**

2005:

Location	Stange, E6
Road surface type	T8g
Test section length	280
Direction	Lane 1 towards Hamar
Date	19092005
Air temperature	17
Road temperature	17

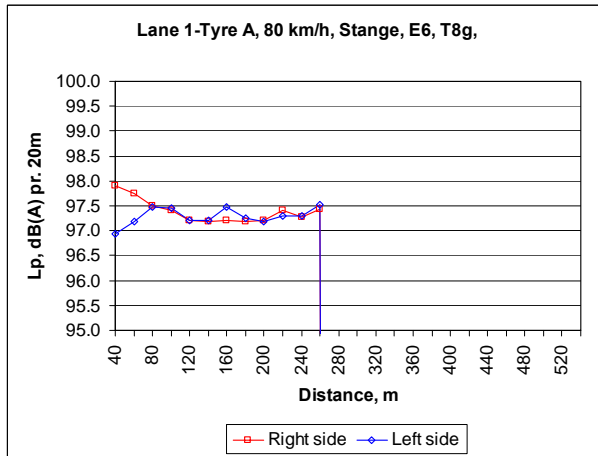
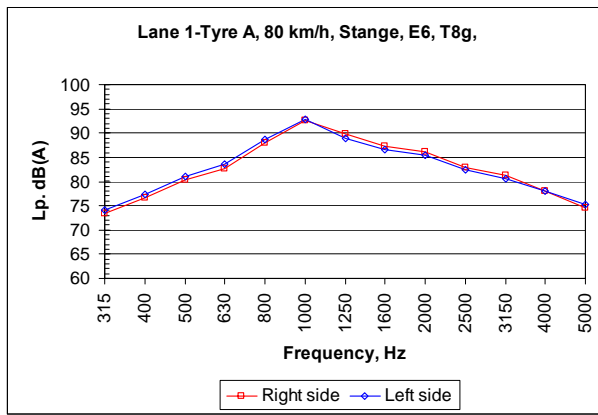
Lane 1-Tyre A, 80 km/h, Stange, E6, T8g,				
Total-average speed for dist. 0 - 260 m		80.9 km/h		
Std.dev.		0.50		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 260 m				
	95.4	51.3	95.2	51.1
Average for dist. 40 - 280 m				
			95.3	51.1
Std.dev.				
			0.55	0.29



**2006:**

Location	Stange, E6
Road surface type	T8g
Test section length	260
Direction	Lane 1
Date	260606
Air temperature	20
Road temperature	21

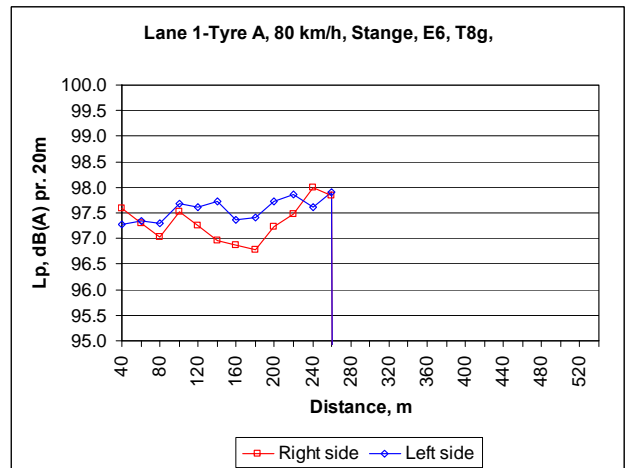
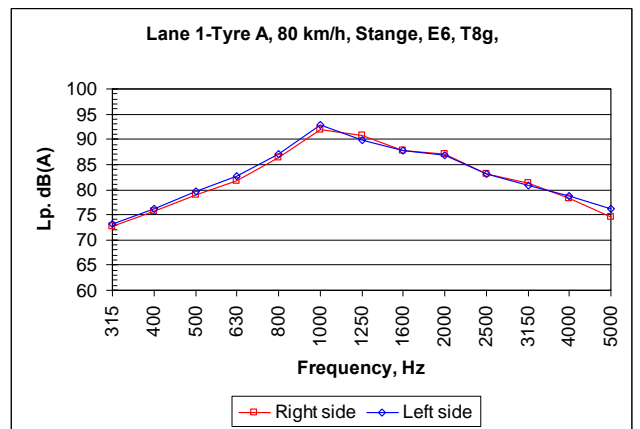
Lane 1-Tyre A, 80 km/h, Stange, E6, T8g,					
Total-average speed for dist. 0 - 260 m		80.3 km/h			
Std.dev.		0.30			
dBA / Distance	Air temp Right s	20 Left s	Temp.corr. to +20C Right side Left side		
Total-average for dist. 0 - 260 m					
		97.4	97.2	97.4	97.2
Average for dist. 40 - 280 m					
		97.4	97.3	97.4	97.3
Std.dev.					
		0.23	0.17	0.23	0.17



**2007:**

Location	Stange, E6
Road surface type	T8g
Test section length	260
Direction	Lane 1
Date	26.06.2007
Air temperature	21
Road temperature	26

Lane 1-Tyre A, 80 km/h, Stange, E6, T8g,					
Total-average speed for dist. 0 - 260 m		81.4 km/h			
Std.dev.		0.20			
dBA / Distance	Air temp Right s	21 Left s	Temp.corr. to +20C Right side Left side		
Total-average for dist. 0 - 260 m					
		97.2	97.3	97.3	97.4
Average for dist. 40 - 280 m					
		97.3	97.6	97.3	97.6
Std.dev.					
		0.38	0.22	0.38	0.22

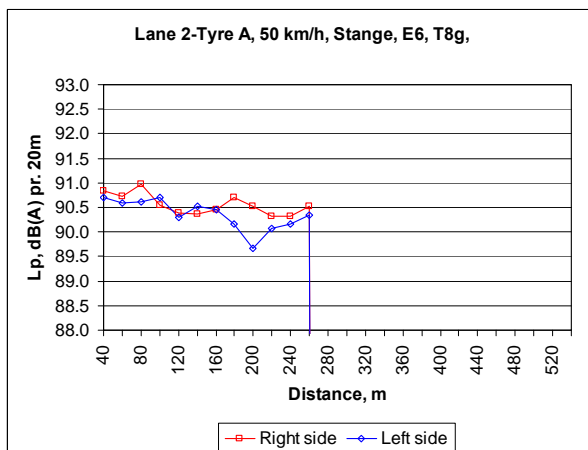
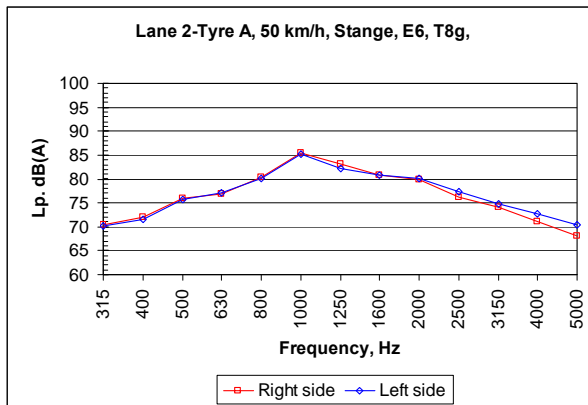


**Pavement 17: T8g. E6- Stange, lane 2, 50 km/h**

2007:

Location	Stange, E6
Road surface type	T8g
Test section length	260
Direction	Lane 2
Date	26.06.2007
Air temperature	21
Road temperature	26

Lane 2-Tyre A, 50 km/h, Stange, E6, T8g,				
Total-average speed for dist. 0 - 260 m		50.6 km/h		
Std.dev.		0.22		
dBA / Distance	Air temp	21	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 260 m				
	90.5	90.3	90.6	90.4
Average for dist. 40 - 280 m				
			90.6	90.4
Std.dev.				
			0.21	0.31

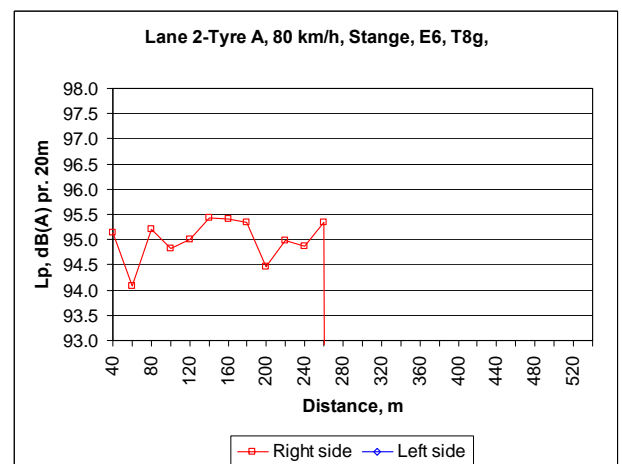
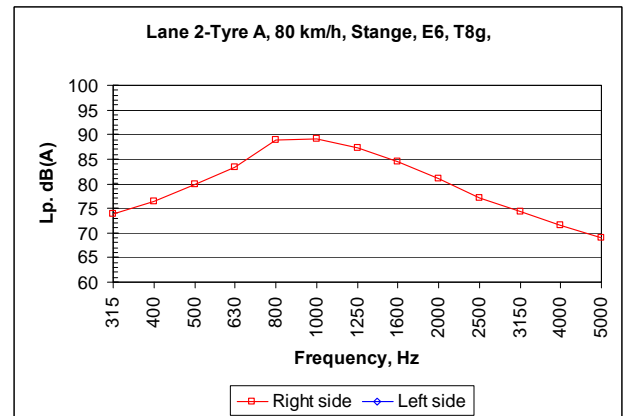


**Pavement 17: T8g. E6- Stange, lane 2, 80 km/h**

2005:

Location	Stange, E6
Road surface type	T8g
Test section length	280
Direction	Lane 2 towards Oslo
Date	19092005
Air temperature	17
Road temperature	17

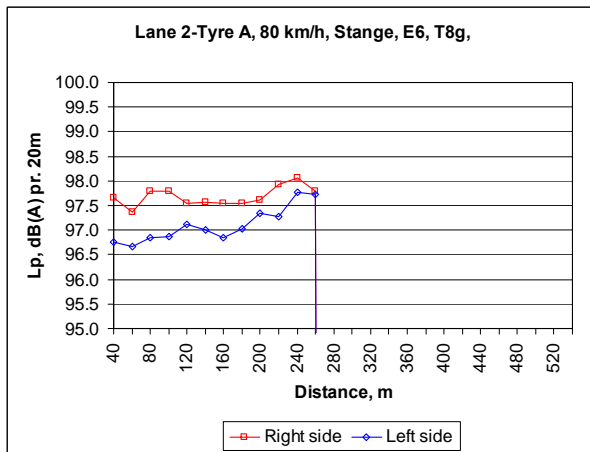
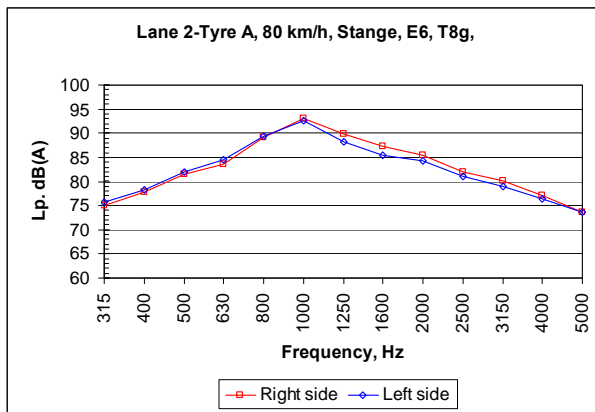
Lane 2-Tyre A, 80 km/h, Stange, E6, T8g,				
Total-average speed for dist. 0 - 260 m		81.1 km/h		
Std.dev.		0.27		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 260 m				
	95.2	51.9	95.0	51.7
Average for dist. 40 - 280 m				
			95.0	51.6
Std.dev.				
			0.41	0.60



**2006:**

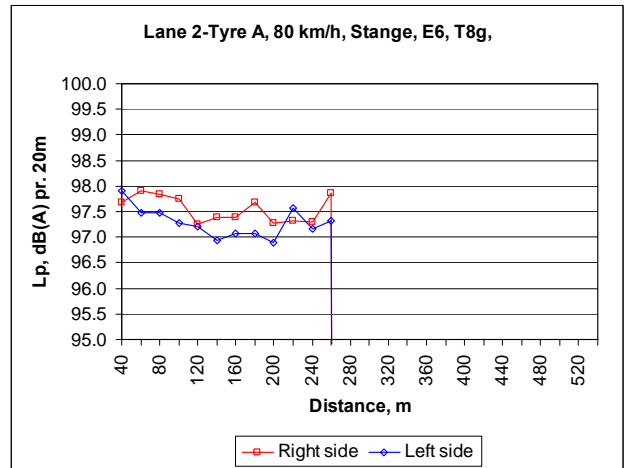
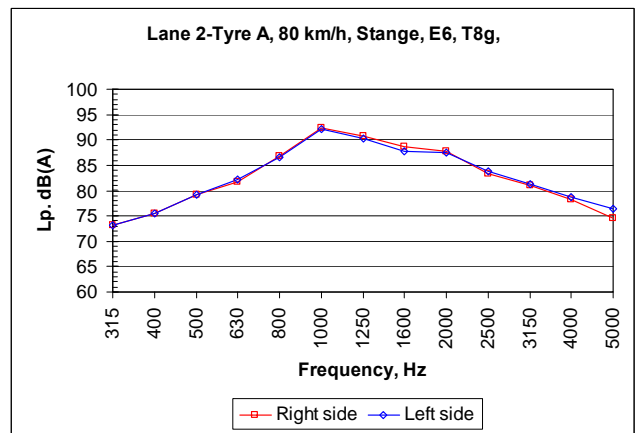
Location	Stange, E6
Road surface type	T8g
Test section length	260
Direction	Lane 2
Date	260606
Air temperature	20
Road temperature	21

Lane 2-Tyre A, 80 km/h, Stange, E6, T8g,				
Total-average speed for dist. 0 - 260 m		80.2 km/h		
Std.dev.		0.27		
dBA / Distance	Air temp	20	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 260 m				
	97.7	97.1	97.7	97.1
Average for dist. 40 - 280 m				
			97.7	97.1
Std.dev.			0.19	0.36


**2007:**

Location	Stange, E6
Road surface type	T8g
Test section length	260
Direction	Lane 2
Date	26.06.2007
Air temperature	21
Road temperature	26

Lane 2-Tyre A, 80 km/h, Stange, E6, T8g,				
Total-average speed for dist. 0 - 260 m		81.3 km/h		
Std.dev.		0.28		
dBA / Distance	Air temp	21	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 260 m				
	97.5	97.2	97.6	97.3
Average for dist. 40 - 280 m				
			97.6	97.3
Std.dev.			0.25	0.29



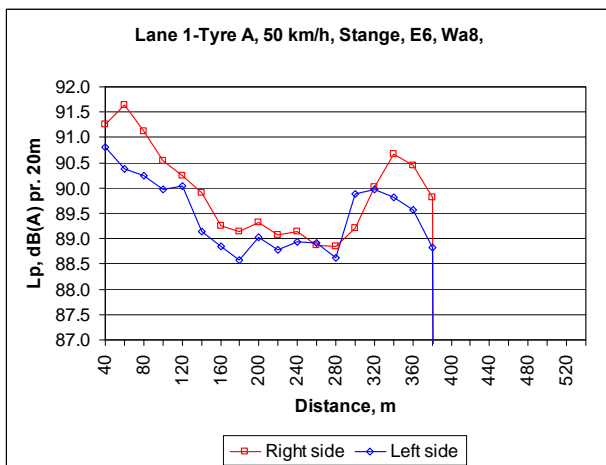
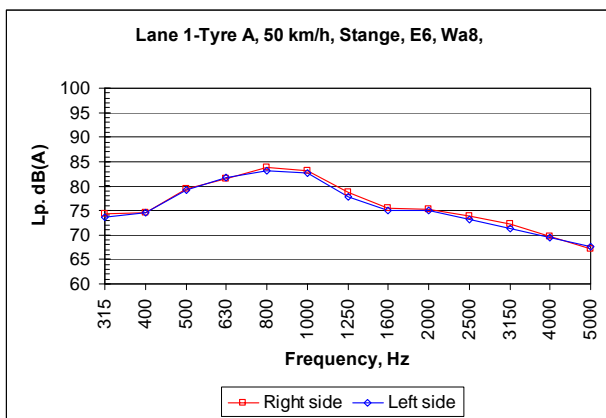


**Pavement 18: Wa8. E6- Stange, lane 1, 50 km/h**

2007:

Location	Stange, E6
Road surface type	Wa8
Test section length	380
Direction	Lane 1
Date	26.06.2007
Air temperature	21
Road temperature	26

Lane 1-Tyre A, 50 km/h, Stange, E6, Wa8,			
Total-average speed for dist. 0 - 380 m		51.2 km/h	
Std.dev.		0.87	
dBA / Distance	Air temp	21	Temp.corr. to +20C
	Right s	Left s	Right side
			Left side
<k for dist. 0 - 380 m			
	90.0	89.5	90.1
			89.6
Average for dist. 40 - 400 m			
			89.9
			89.5
Std.dev.			
			0.88
			0.69

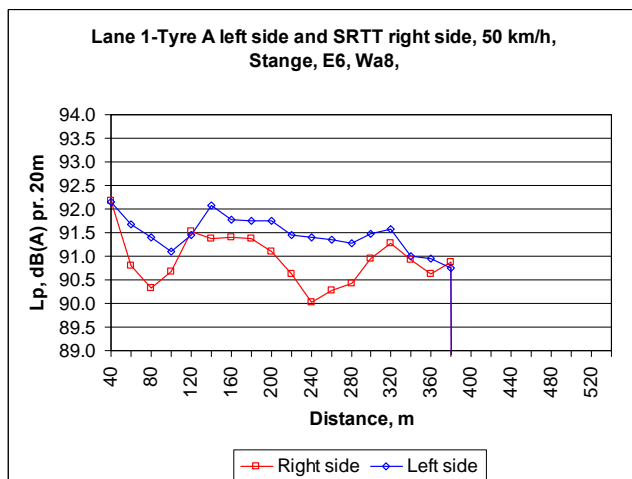
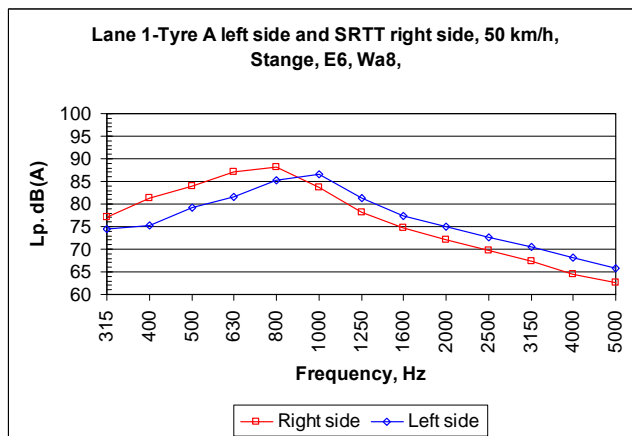


2008:

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Stange, E6
Road surface type	Wa8
Test section length	380
Direction	Lane 1 towards Hamar
Date	25.06.2008
Air temperature	17
Road temperature	21

Lane 1-Tyre A left side and SRTT right side, 50 km/h, Stange, E6, Wa8,			
Total-average speed for dist. 0 - 380 m		52.5 km/h	
Std.dev.		0.67	
dBA / Distance	Air temp	17	Temp.corr. to +20C
	Right s	Left s	Right side
			Left side
Total-average for dist. 0 - 380 m			
	91.2	91.8	91.0
			91.6
Average for dist. 40 - 400 m			
			90.9
			91.5
Std.dev.			
			0.53
			0.37

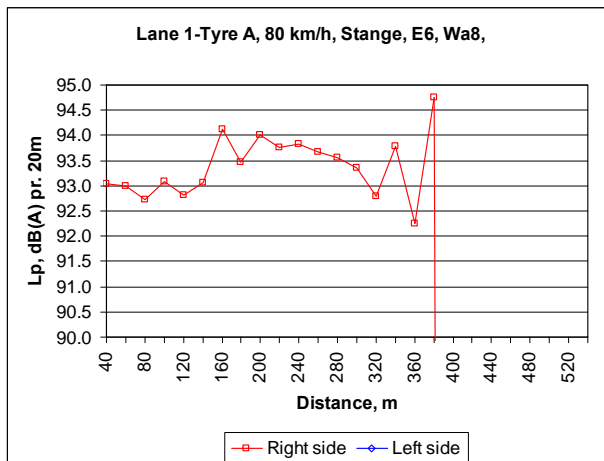
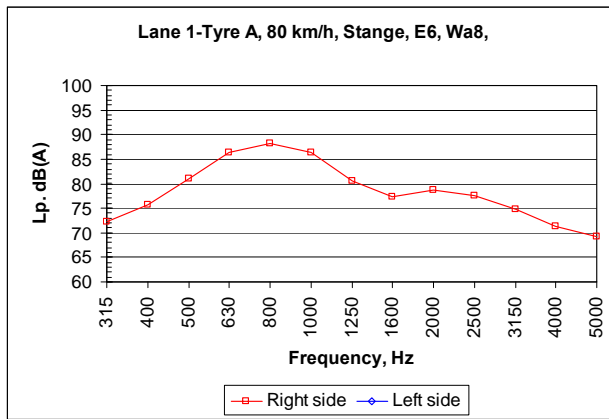


### Pavement 18: Wa8. E6- Stange, lane 1, 80 km/h

**2005:**

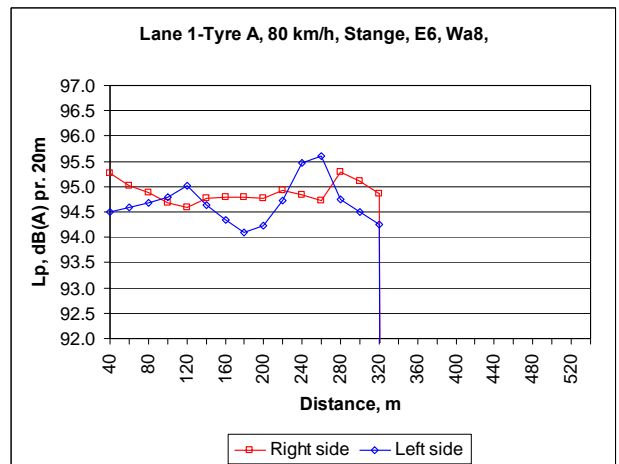
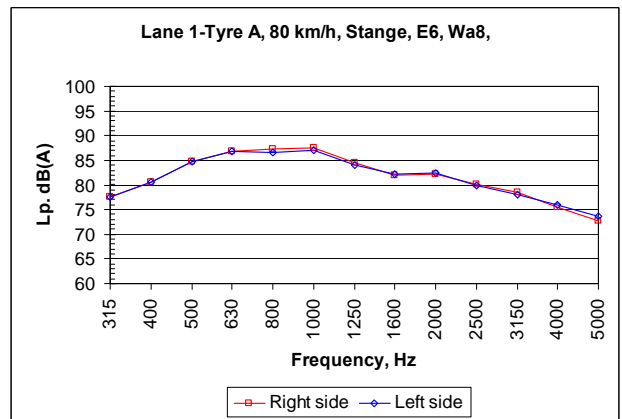
Location	Stange, E6
Road surface type	Wa8
Test section length	280
Direction	Lane 1 towards Hamar
Date	19092005
Air temperature	17
Road temperature	17

Lane 1-Tyre A, 80 km/h, Stange, E6, Wa8,				
Total-average speed for dist. 0 - 380 m		81.0 km/h		
Std.dev.		0.77		
dBA / Distance	Air temp Right s	17 Left s	Temp.corr. to +20C Right side Left side	
Total-average for dist. 0 - 380 m	93.6	51.7	93.5	51.6
Average for dist. 40 - 400 m			93.4	51.6
Std.dev.			0.61	0.42


**2006:**

Location	Stange, E6
Road surface type	Wa8
Test section length	320
Direction	Lane 1
Date	260606
Air temperature	20
Road temperature	21

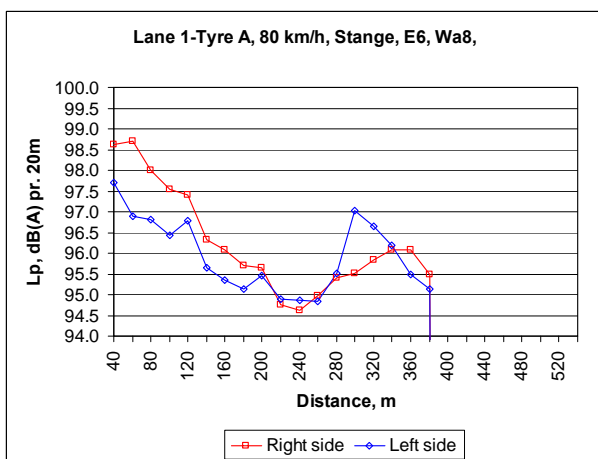
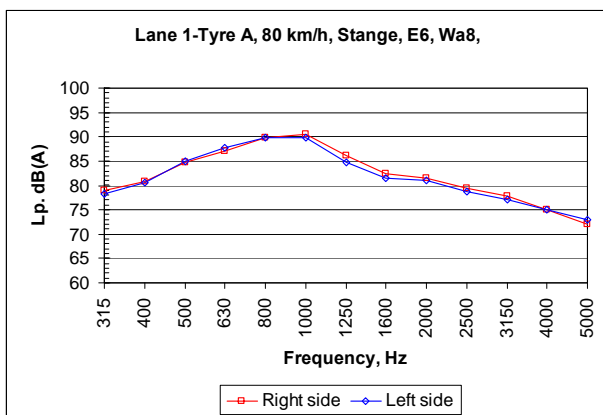
Lane 1-Tyre A, 80 km/h, Stange, E6, Wa8,				
Total-average speed for dist. 0 - 320 m		79.5 km/h		
Std.dev.		0.28		
dBA / Distance	Air temp Right s	20 Left s	Temp.corr. to +20C Right side Left side	
Total-average for dist. 0 - 320 m	95.0	94.6	95.0	94.6
Average for dist. 40 - 340 m			94.9	94.7
Std.dev.			0.20	0.42



2007:

Location	Stange, E6
Road surface type	Wa8
Test section length	380
Direction	Lane 1
Date	26.06.2007
Air temperature	21
Road temperature	26

Lane 1-Tyre A, 80 km/h, Stange, E6, Wa8,			
Total-average speed for dist. 0 - 380 m		81.2 km/h	
Std.dev.		0.75	
dBA / Distance	Air temp Right s	21 Left s	Temp.corr. to +20C Right side Left side
<k for dist. 0 - 380 m			
		96.5	96.1
Average for dist. 40 - 400 m		96.3	95.9
Std.dev.		1.26	0.88

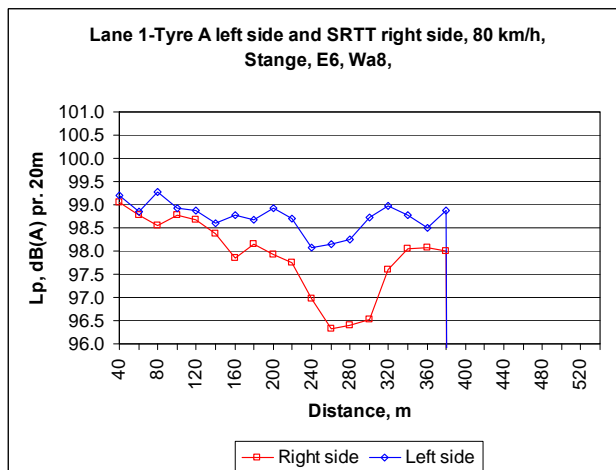
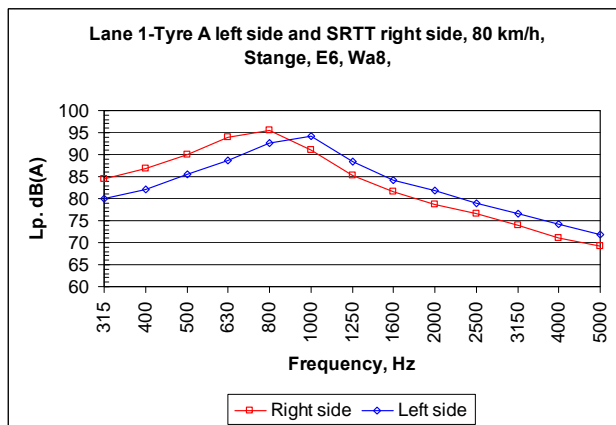


2008:

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Stange, E6
Road surface type	Wa8
Test section length	380
Direction	Lane 1 towards Hamar
Date	25.06.2008
Air temperature	17
Road temperature	21

Lane 1-Tyre A left side and SRTT right side, 80 km/h, Stange, E6, Wa8,			
Total-average speed for dist. 0 - 380 m		81.2 km/h	
Std.dev.		0.48	
dBA / Distance	Air temp Right s	17 Left s	Temp.corr. to +20C Right side Left side
Total-average for dist. 0 - 380 m			
		98.1	99.0
Average for dist. 40 - 400 m		98.0	98.8
Std.dev.		0.83	0.33

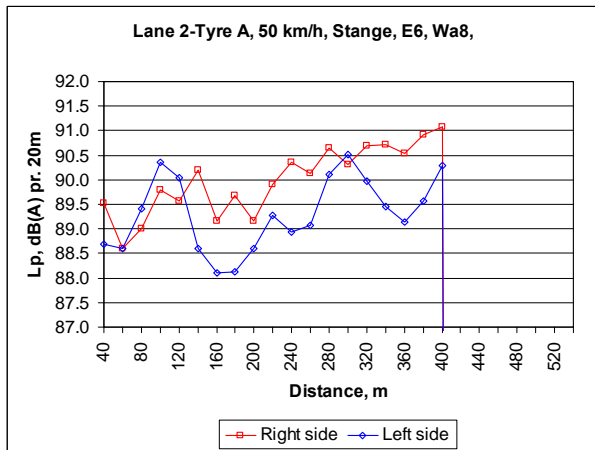
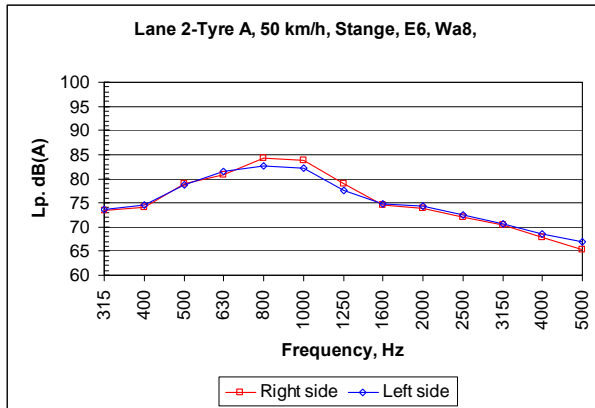


**Pavement 18: Wa8. E6- Stange, lane 2, 50 km/h**

**2007:**

Location	Stange, E6
Road surface type	Wa8
Test section length	400
Direction	Lane 2
Date	26.06.2007
Air temperature	21
Road temperature	26

Lane 2-Tyre A, 50 km/h, Stange, E6, Wa8,				
Total-average speed for dist. 0 - 400 m		50.6 km/h		
Std.dev.		0.25		
dBA / Distance	Air temp	21	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 400 m				
	89.9	89.2	89.9	89.3
Average for dist. 40 - 420 m				
			90.0	89.3
Std.dev.				
			0.70	0.75

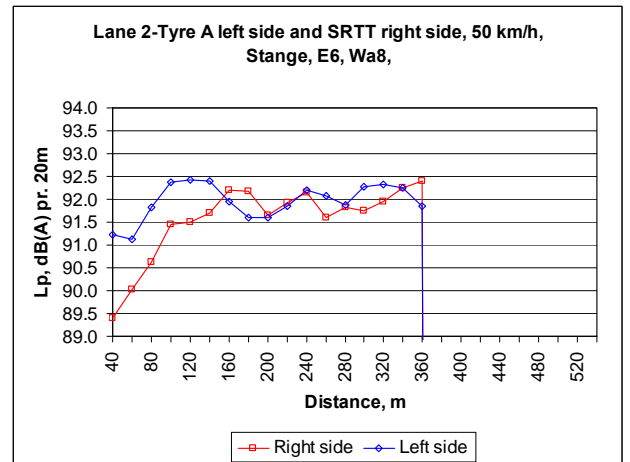
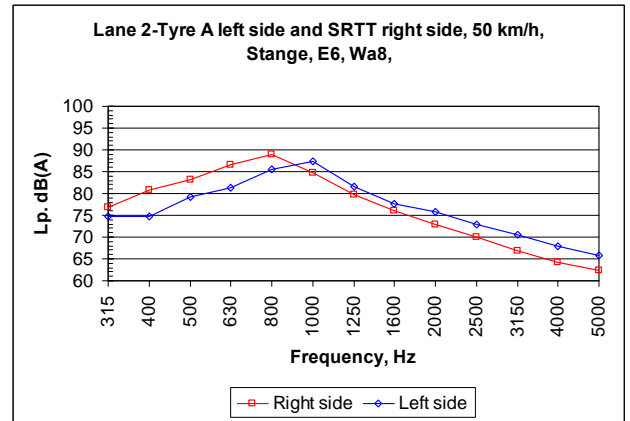


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Stange, E6
Road surface type	Wa8
Test section length	360
Direction	Lane 2 towards Oslo
Date	25.06.2008
Air temperature	17
Road temperature	21

Lane 2-Tyre A left side and SRTT right side, 50 km/h, Stange, E6, Wa8				
Total-average speed for dist. 0 - 360 m		54.0 km/h		
Std.dev.		1.05		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 360 m				
	91.5	92.0	91.3	91.8
Average for dist. 40 - 380 m				
			91.6	92.0
Std.dev.				
			0.82	0.40

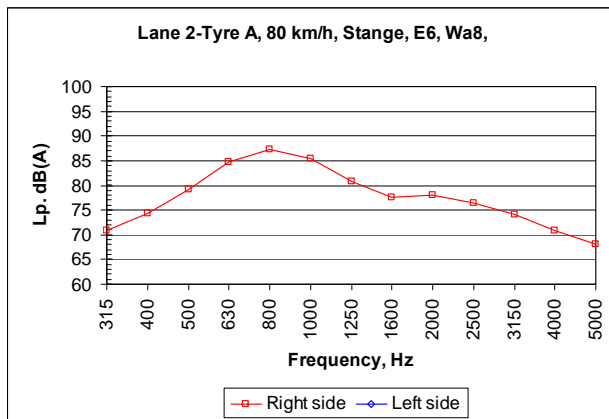


**Pavement 18: Wa8. E6- Stange, lane 2, 80 km/h**

2005:

Location	Stange, E6
Road surface type	Wa8
Test section length	380
Direction	Lane 2 towards Oslo
Date	19092005
Air temperature	17
Road temperature	17

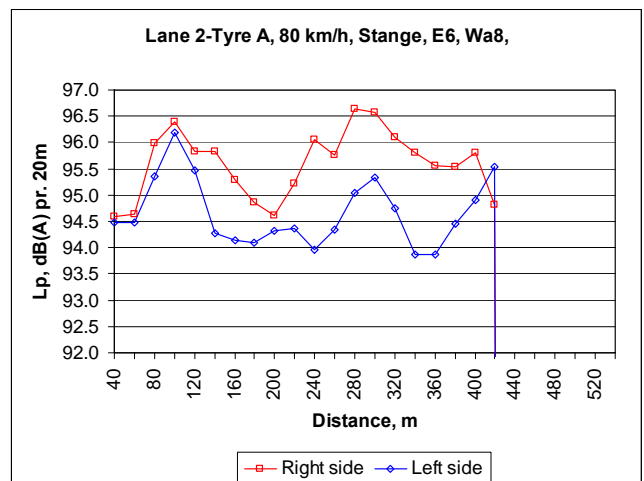
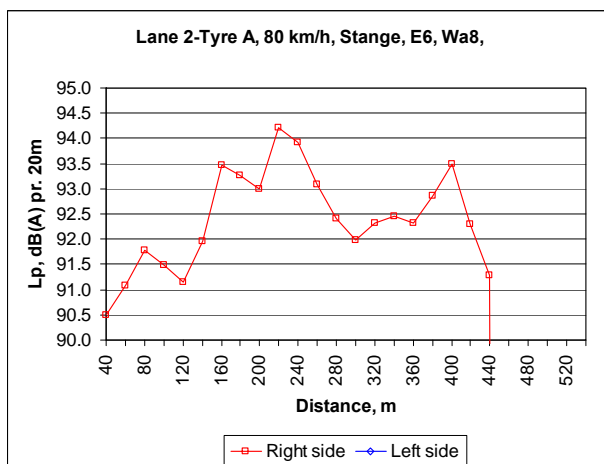
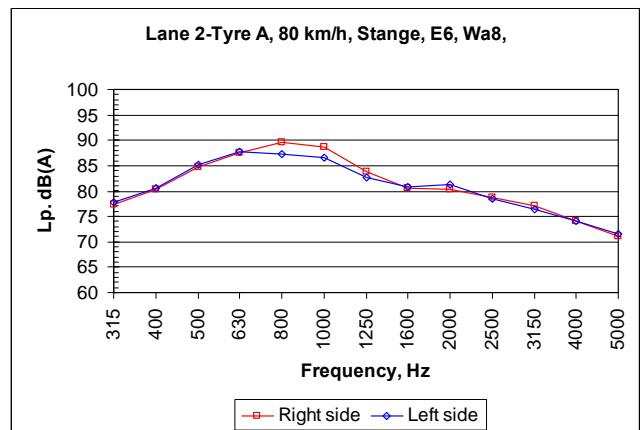
Lane 2-Tyre A, 80 km/h, Stange, E6, Wa8,				
Total-average speed for dist. 0 - 440 m		80.9 km/h		
Std.dev.		0.18		
dBA / Distance	Air temp	Right s	Left s	Temp.corr. to +20C
		Right side	Left side	
Total-average for dist. 0 - 440 m				
		92.5	51.5	92.4 51.4
Average for dist. 40 - 460 m				
				92.4 51.4
Std.dev.				
		0.99	0.59	



2006:

Location	Stange, E6
Road surface type	Wa8
Test section length	420
Direction	Lane 2
Date	260606
Air temperature	20
Road temperature	21

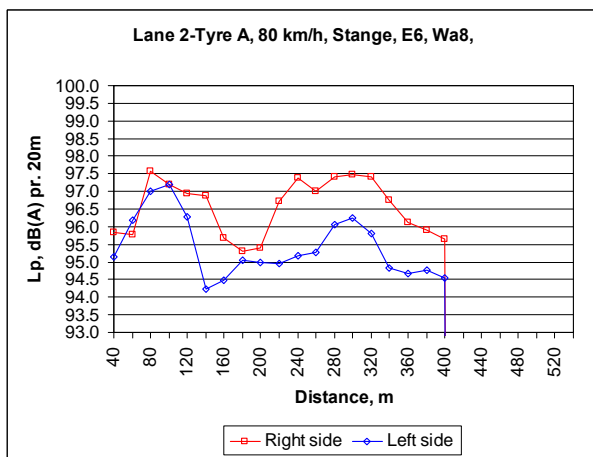
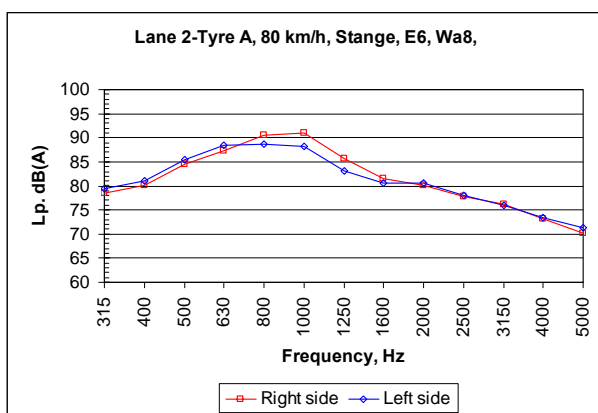
Lane 2-Tyre A, 80 km/h, Stange, E6, Wa8,				
Total-average speed for dist. 0 - 420 m		79.9 km/h		
Std.dev.		0.22		
dBA / Distance	Air temp	Right s	Left s	Temp.corr. to +20C
		Right side	Left side	
Total-average for dist. 0 - 420 m				
		95.5	94.6	95.5 94.6
Average for dist. 40 - 440 m				
				95.6 94.7
Std.dev.				
		0.64	0.64	



**2007:**

Location	Stange, E6
Road surface type	Wa8
Test section length	400
Direction	Lane 2
Date	26.06.2007
Air temperature	21
Road temperature	26

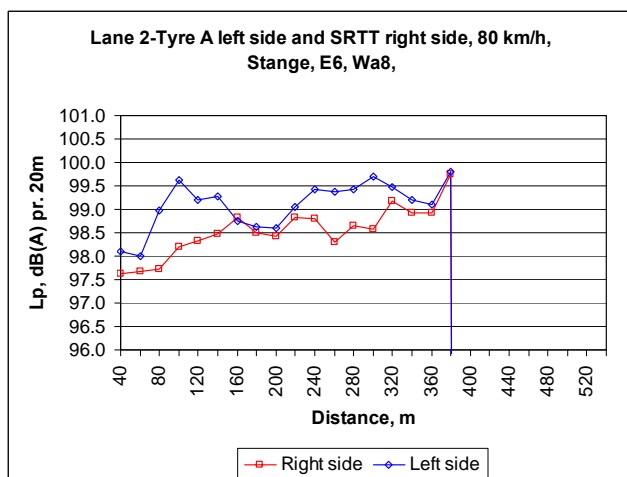
Lane 2-Tyre A, 80 km/h, Stange, E6, Wa8,					
Total-average speed for dist. 0 - 400 m		81.1 km/h			
Std.dev.		0.27			
dBA / Distance	Air temp Right s	21 Left s	Temp.corr. to +20C Right side Left side		
<k for dist. 0 - 400 m					
		96.4	95.4	96.5	95.4
Average for dist. 40 - 420 m					
Std.dev.		0.79			0.86


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Stange, E6
Road surface type	Wa8
Test section length	380
Direction	Lane 2 towards Oslo
Date	25.06.2008
Air temperature	17
Road temperature	21

Lane 2-Tyre A left side and SRTT right side, 80 km/h, Stange, E6, Wa8,					
Total-average speed for dist. 0 - 380 m		82.7 km/h			
Std.dev.		1.02			
dBA / Distance	Air temp Right s	17 Left s	Temp.corr. to +20C Right side Left side		
Total-average for dist. 0 - 380 m					
		98.5	99.2	98.3	99.0
Average for dist. 40 - 400 m					
Std.dev.		0.54			0.51

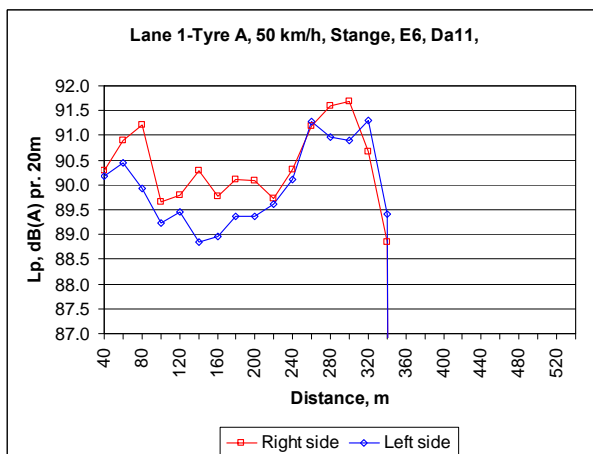
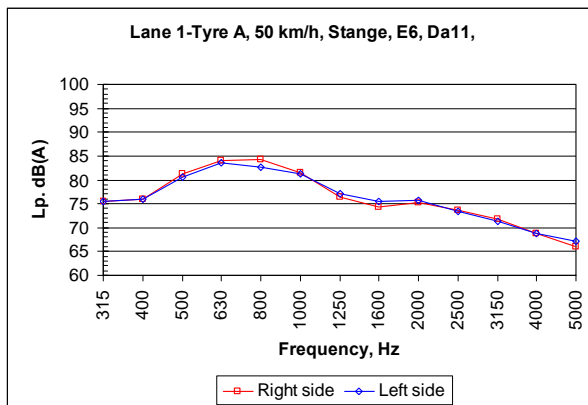


**Pavement 19: Da11. E6 - Stange, lane 1, 50 km/h**

**2007:**

Location	Stange, E6
Road surface type	Da11
Test section length	340
Direction	Lane 1
Date	26.06.2007
Air temperature	21
Road temperature	26

Lane 1-Tyre A, 50 km/h, Stange, E6, Da11,			
Total-average speed for dist. 0 - 340 m		51.6 km/h	
Std.dev.		1.54	
dBA / Distance	Air temp	21	Temp.corr. to +20C
	Right s	Left s	Right side Left side
<k for dist. 0 - 340 m			
	90.4	89.9	90.4 89.9
Average for dist. 40 - 360 m			
			90.4 90.0
Std.dev.			
			0.78 0.81

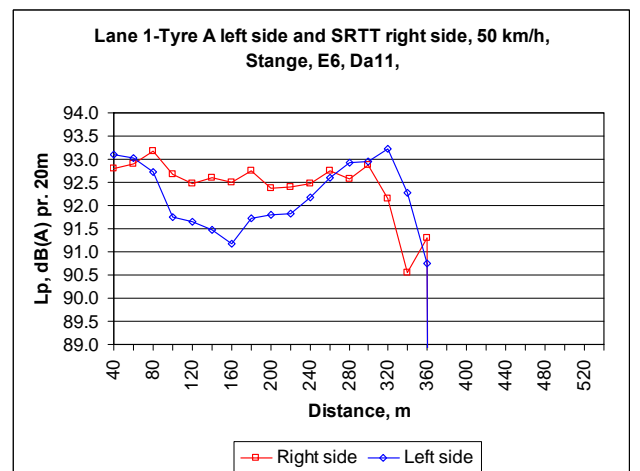
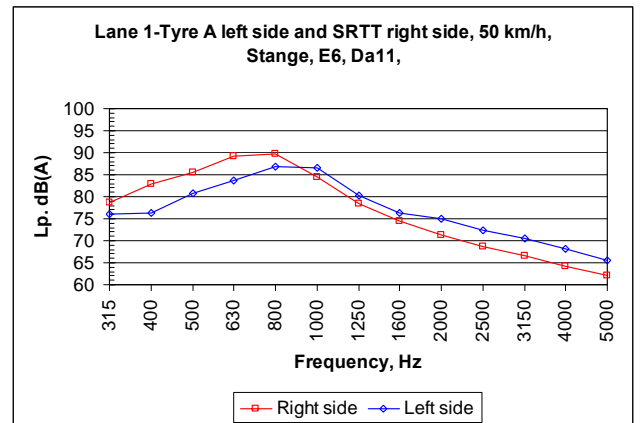


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Stange, E6
Road surface type	Da11
Test section length	360
Direction	Lane 1 towards Hamar
Date	25.06.2008
Air temperature	17
Road temperature	21

Lane 1-Tyre A left side and SRTT right side, 50 km/h, Stange, E6, Da11			
Total-average speed for dist. 0 - 360 m		53.8 km/h	
Std.dev.		0.75	
dBA / Distance	Air temp	17	Temp.corr. to +20C
	Right s	Left s	Right side Left side
Total-average for dist. 0 - 360 m			
	92.6	92.4	92.5 92.2
Average for dist. 40 - 380 m			
			92.4 92.2
Std.dev.			
			0.63 0.74

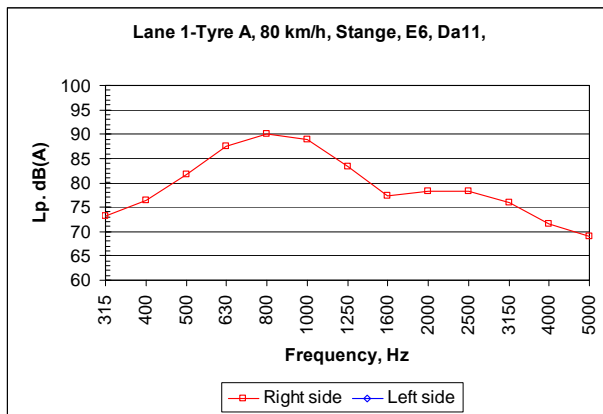


**Pavement 19: Da11. E6 - Stange, lane 1, 80 km/h**

**2005:**

Location	Stange, E6
Road surface type	Da11
Test section length	300
Direction	Lane 1 towards Hamar
Date	19092005
Air temperature	17
Road temperature	17

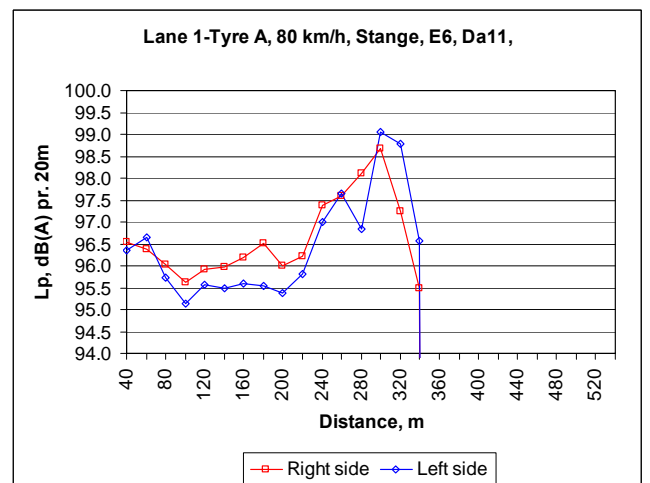
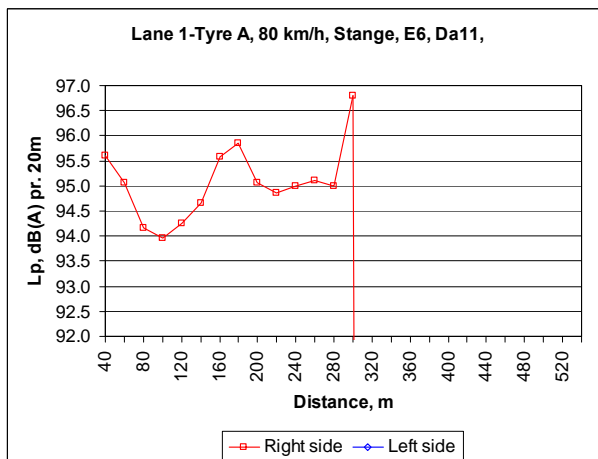
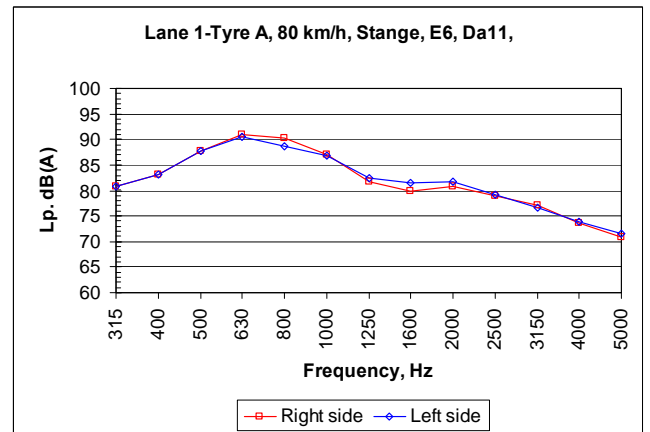
Lane 1-Tyre A, 80 km/h, Stange, E6, Da11,				
Total-average speed for dist. 0 - 300 m		81.0		km/h
Std.dev.		0.27		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 300 m			95.2	51.6
Average for dist. 40 - 320 m			95.1	51.6
Std.dev.			0.74	0.25



**2006:**

Location	Stange, E6
Road surface type	Da11
Test section length	340
Direction	Lane 1
Date	260606
Air temperature	20
Road temperature	21

Lane 1-Tyre A, 80 km/h, Stange, E6, Da11,				
Total-average speed for dist. 0 - 340 m		80.2		km/h
Std.dev.		0.25		
dBA / Distance	Air temp	20	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 340 m			96.6	96.4
Average for dist. 40 - 360 m			96.6	96.4
Std.dev.			0.92	1.19

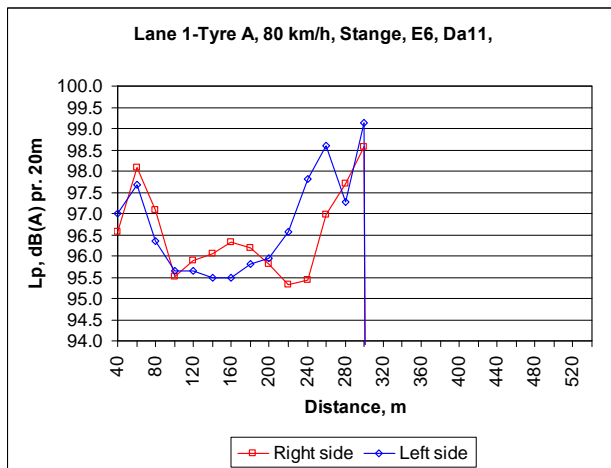
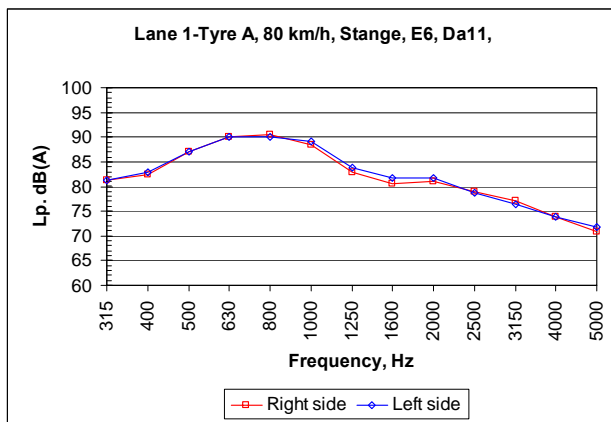




2007:

Location	Stange, E6
Road surface type	Da11
Test section length	300
Direction	Lane 1
Date	26.06.2007
Air temperature	21
Road temperature	26

Lane 1-Tyre A, 80 km/h, Stange, E6, Da11,			
Total-average speed	for dist. 0 - 340 m	81.3	km/h
Std.dev.		0.57	
dBA / Distance	Air temp	21	Temp.corr. to +20C
	Right s	Left s	Right side
			Left side
<k for dist. 0 - 340 m			
	96.5	96.8	96.6
Average	for dist. 40 - 320 m	96.5	96.7
Std.dev.		1.01	1.20

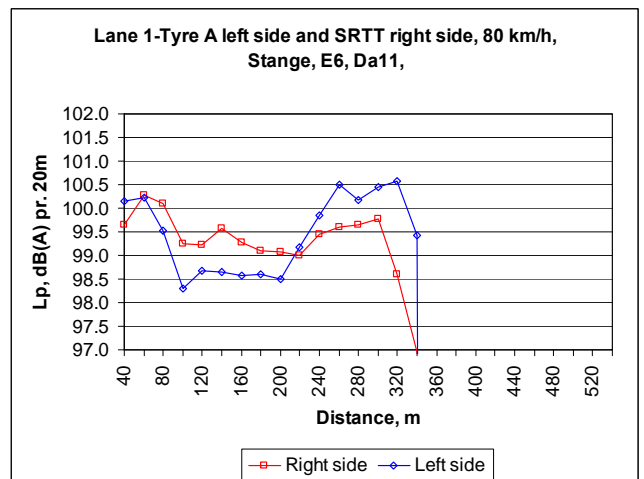
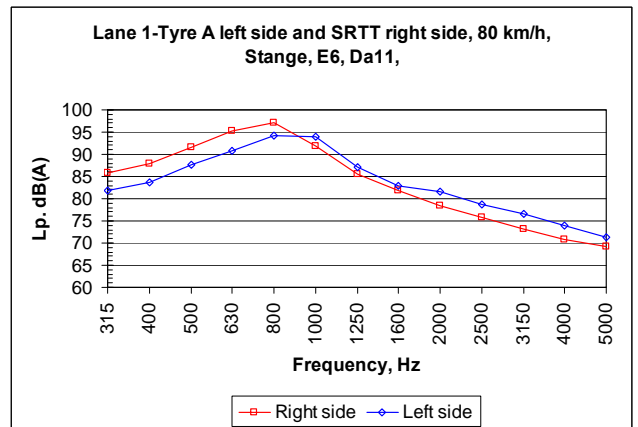


2008:

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Stange, E6
Road surface type	Da11
Test section length	340
Direction	Lane 1 towards Hamar
Date	25.06.2008
Air temperature	17
Road temperature	21

Lane 1-Tyre A left side and SRTT right side, 80 km/h, Stange, E6, Da11,			
Total-average speed	for dist. 0 - 340 m	82.2	km/h
Std.dev.		0.74	
dBA / Distance	Air temp	17	Temp.corr. to +20C
	Right s	Left s	Right side
			Left side
Total-average for dist. 0 - 340 m			
	99.5	99.7	99.3
Average	for dist. 40 - 360 m	99.3	99.5
Std.dev.		0.75	0.83

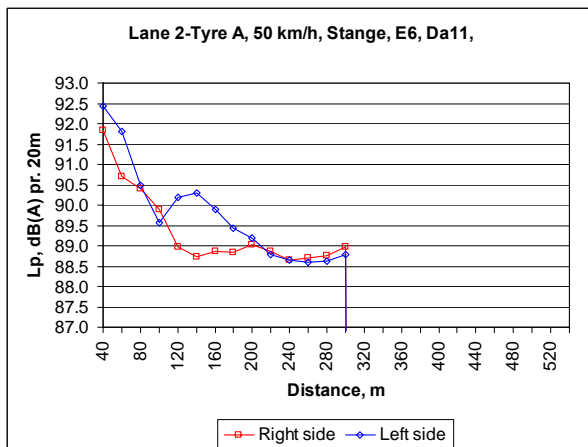
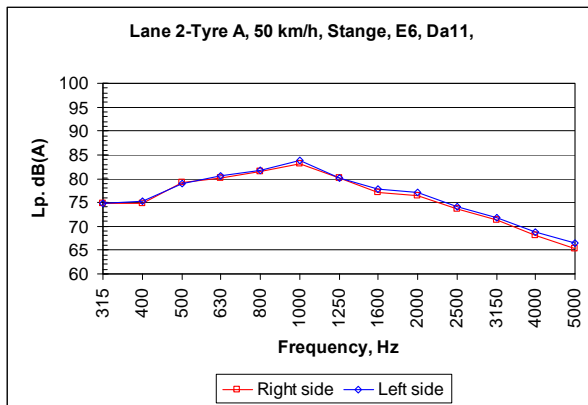


**Pavement 19: Da11. E6 - Stange, lane 2, 50 km/h**

**2007:**

Location	Stange, E6
Road surface type	Da11
Test section length	340
Direction	Lane 2
Date	26.06.2007
Air temperature	21
Road temperature	26

Lane 2-Tyre A, 50 km/h, Stange, E6, Da11,				
Total-average speed for dist. 0 - 300 m		50.7 km/h		
Std.dev.		0.23		
dBA / Distance	Air temp	21	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 300 m				
	89.7	90.0	89.8	90.1
Average for dist. 40 - 320 m				
			89.4	89.8
Std.dev.				
			0.97	1.20

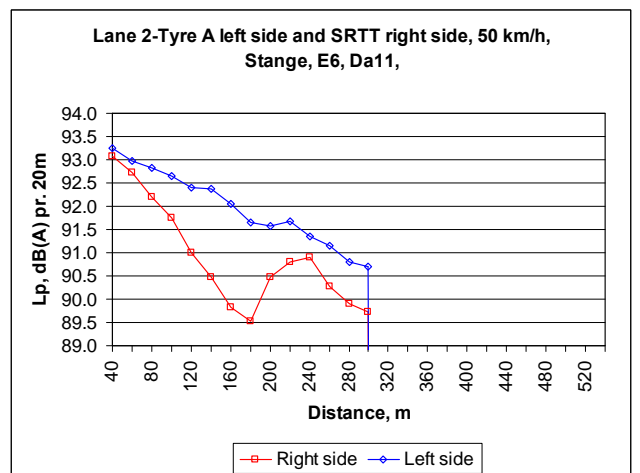
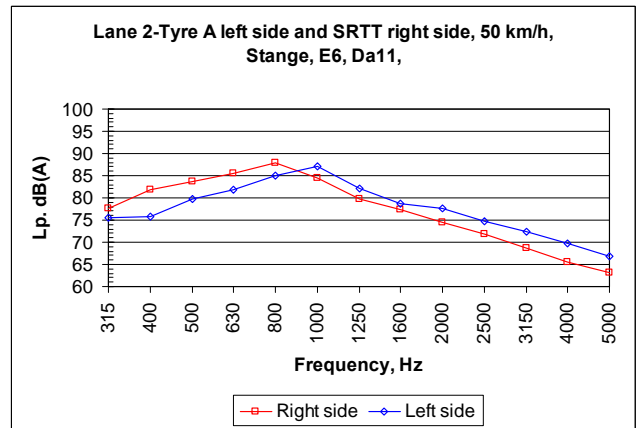


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Stange, E6
Road surface type	Da11
Test section length	300
Direction	Lane 2 towards Oslo
Date	25.06.2008
Air temperature	17
Road temperature	21

Lane 2-Tyre A left side and SRTT right side, 50 km/h, Stange, E6, Da11,				
Total-average speed for dist. 0 - 300 m		53.5 km/h		
Std.dev.		0.35		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 300 m				
	91.3	92.3	91.1	92.1
Average for dist. 40 - 320 m				
			90.9	92.0
Std.dev.				
			1.14	0.81

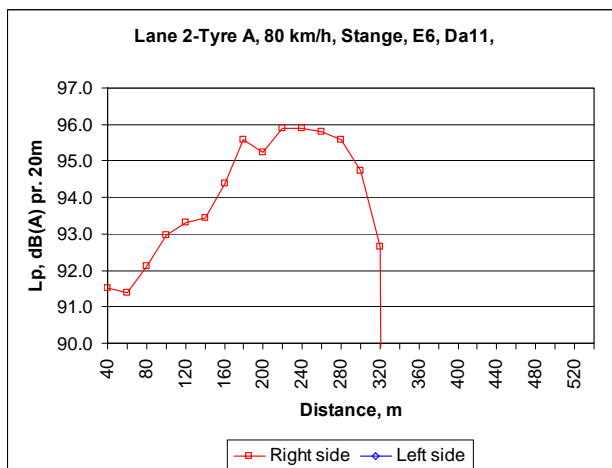
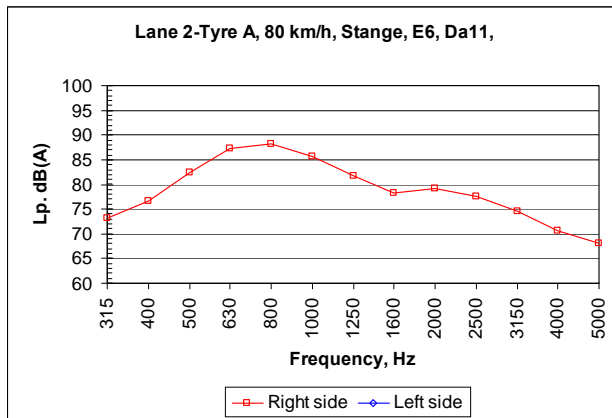


**Pavement 19: Da11. E6 - Stange, lane 2, 80 km/h**

**2005:**

Location	Stange, E6
Road surface type	Da11
Test section length	320
Direction	Lane 2 towards Oslo
Date	19092005
Air temperature	17
Road temperature	17

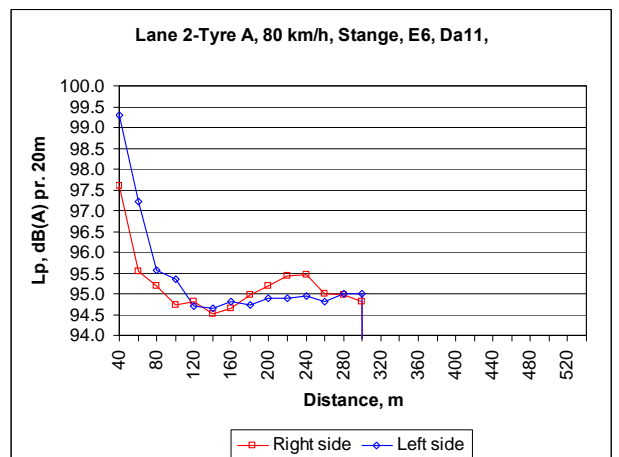
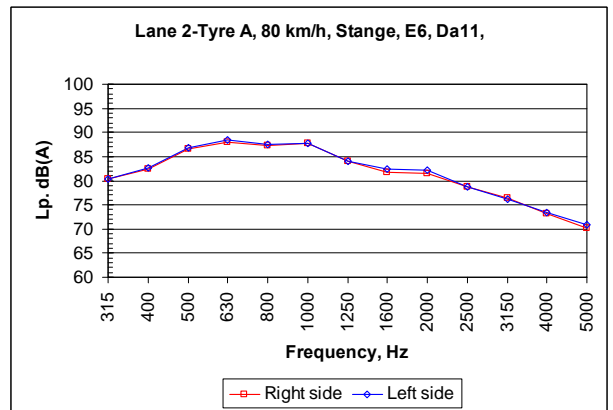
Lane 2-Tyre A, 80 km/h, Stange, E6, Da11,				
Total-average speed for dist. 0 - 320 m		81.4		km/h
Std.dev.		0.39		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 320 m		93.7		51.9
		93.8		52.0
Average for dist. 40 - 340 m		94.0		51.9
Std.dev.		1.64		0.79



**2006:**

Location	Stange, E6
Road surface type	Da11
Test section length	300
Direction	Lane 2
Date	260606
Air temperature	20
Road temperature	21

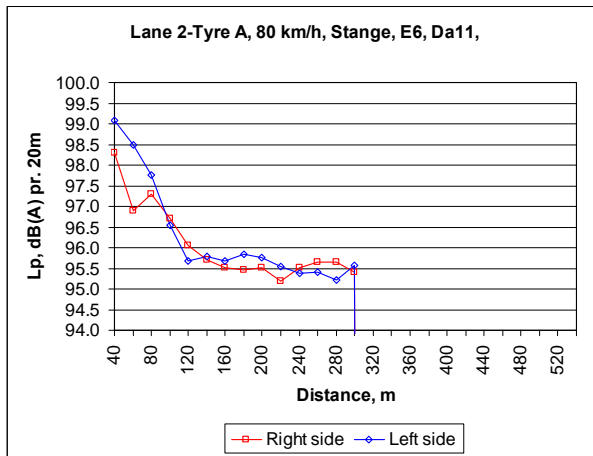
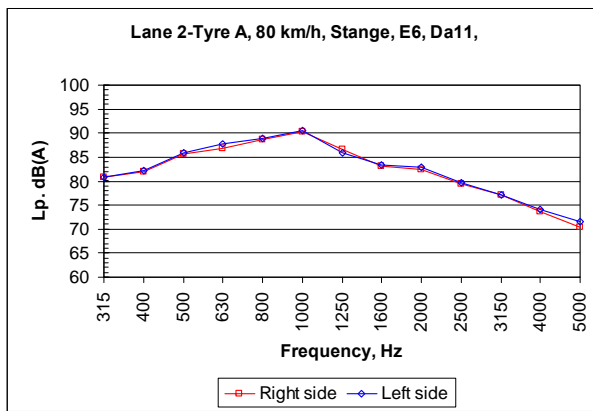
Lane 2-Tyre A, 80 km/h, Stange, E6, Da11,				
Total-average speed for dist. 0 - 300 m		80.4		km/h
Std.dev.		0.22		
dBA / Distance	Air temp	20	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 300 m		95.6		95.9
		95.6		95.9
Average for dist. 40 - 320 m		95.2		95.4
Std.dev.		0.76		1.29



2007:

Location	Stange, E6
Road surface type	Da11
Test section length	300
Direction	Lane 2
Date	26.06.2007
Air temperature	21
Road temperature	26

Lane 2-Tyre A, 80 km/h, Stange, E6, Da11,				
Total-average speed for dist. 0 - 300 m		81.6 km/h		
Std.dev.		0.30		
dBA / Distance	Air temp	21	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 300 m				
	96.4	96.6	96.4	96.7
Average for dist. 40 - 320 m				
			96.1	96.3
Std.dev.				
			0.90	1.25

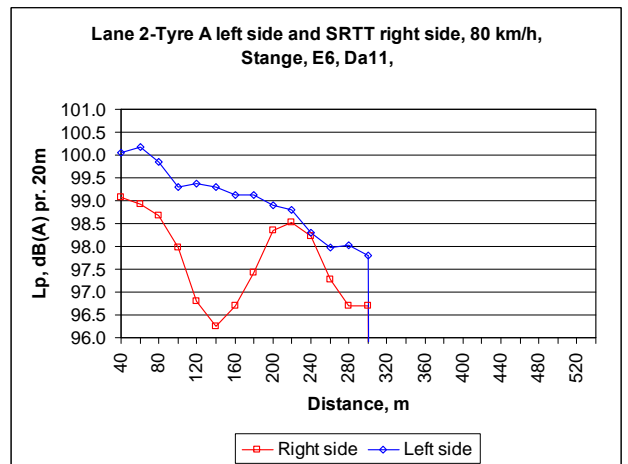
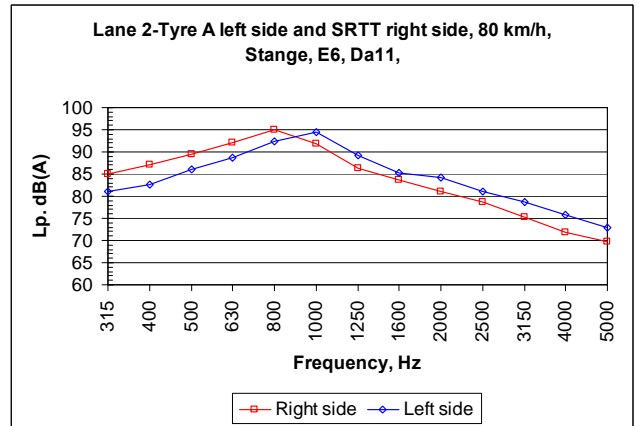


2008:

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Stange, E6
Road surface type	Da11
Test section length	300
Direction	Lane 2 towards Oslo
Date	25.06.2008
Air temperature	17
Road temperature	21

Lane 2-Tyre A left side and SRTT right side, 80 km/h, Stange, E6, Da11,				
Total-average speed for dist. 0 - 300 m		83.1 km/h		
Std.dev.		0.55		
dBA / Distance	Air temp	17	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 300 m				
	98.1	99.3	97.9	99.1
Average for dist. 40 - 320 m				
			97.7	99.0
Std.dev.				
			0.96	0.76

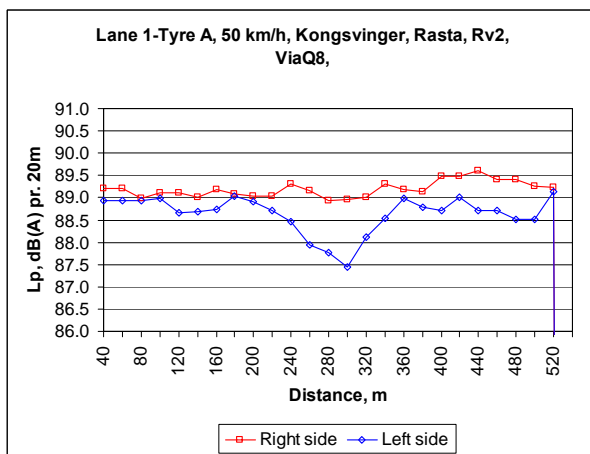
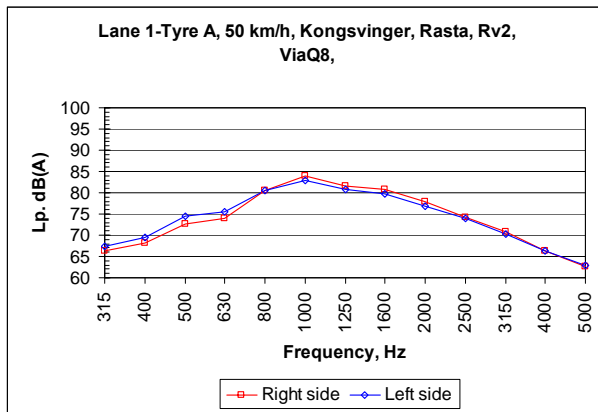


**Pavement 20: ViaQ8. Rv2 - Rasta, lane 1, 50 km/h**

**2006:**

Location	Kongsvinger, Rasta, Rv2
Road surface type	ViaQ8
Test section length	520
Direction	Lane 1
Date	10.10.2006
Air temperature	15
Road temperature	13

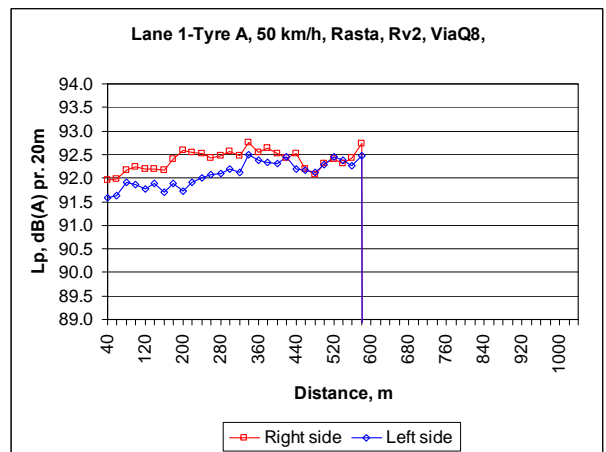
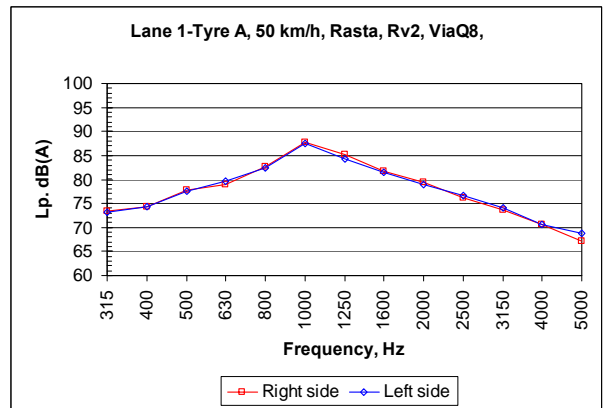
Lane 1-Tyre A, 50 km/h, Kongsvinger, Rasta, Rv2, ViaQ8,				
Total-average speed for dist. 0 - 520 m		51.3 km/h		
Std.dev.		0.39		
dBA / Distance	Air temp	15	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 520 m			
	89.5	89.0	89.2	88.7
Average	for dist. 40 - 540 m		89.2	88.6
Std.dev.			0.18	0.42



**2007:**

Location	Rasta, Rv2
Road surface type	ViaQ8
Test section length	600
Direction	Lane 1
Date	25.06.2007
Air temperature	18
Road temperature	18

Lane 1-Tyre A, 50 km/h, Rasta, Rv2, ViaQ8,				
Total-average speed for dist. 0 - 580 m		50.6 km/h		
Std.dev.		0.21		
dBA / Distance	Air temp	18	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 580 m				
	92.5	92.2	92.4	92.1
Average	for dist. 40 - 600 m		92.4	92.1
Std.dev.			0.21	0.27

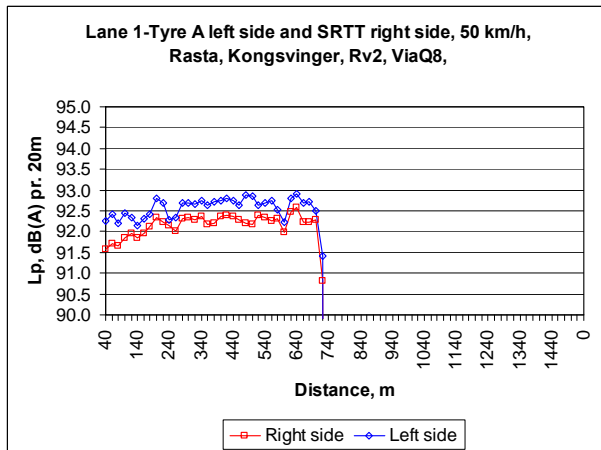
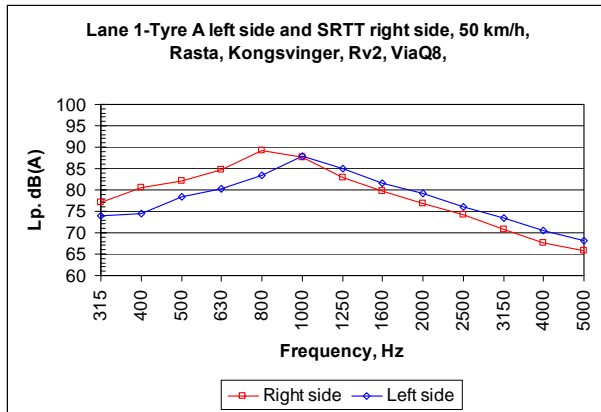


2008:

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Rasta, Kongsvinger, Rv2
Road surface type	ViaQ8
Test section length	720
Direction	Lane 1
Date	25.06.2008
Air temperature	21
Road temperature	32

Lane 1-Tyre A left side and SRTT right side, 50 km/h, Rasta, Kongsvinger, Rv2, ViaQ8				
Total-average speed for dist. 0 - 720 m		52.0 km/h		
Std.dev.		1.24		
dBA / Distance	Air temp	21	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 720 m				
	92.0	92.5	92.1	92.5
Average for dist. 40 - 740 m			92.1	92.6
Std.dev.			0.33	0.29

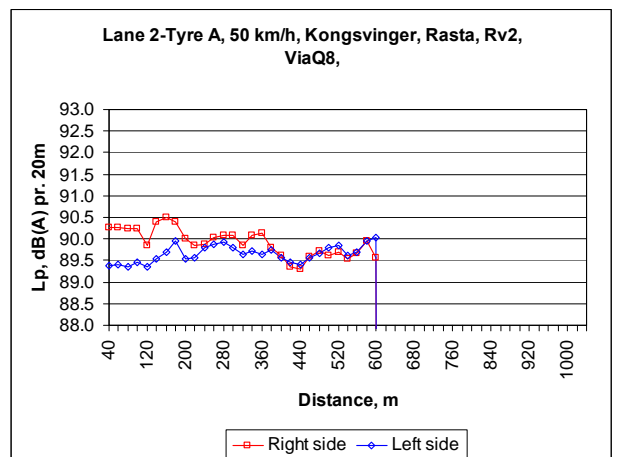
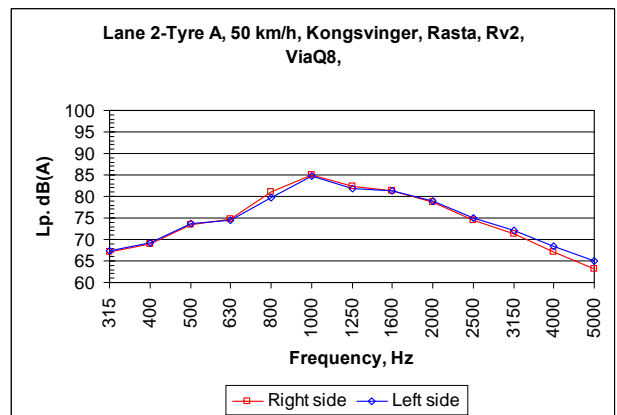


**Pavement 20: ViaQ8. Rv2 - Rasta, lane 2, 50 km/h**

2006:

Location	Kongsvinger, Rasta, Rv2
Road surface type	ViaQ8
Test section length	600
Direction	Lane 2
Date	10.10.2006
Air temperature	15
Road temperature	13

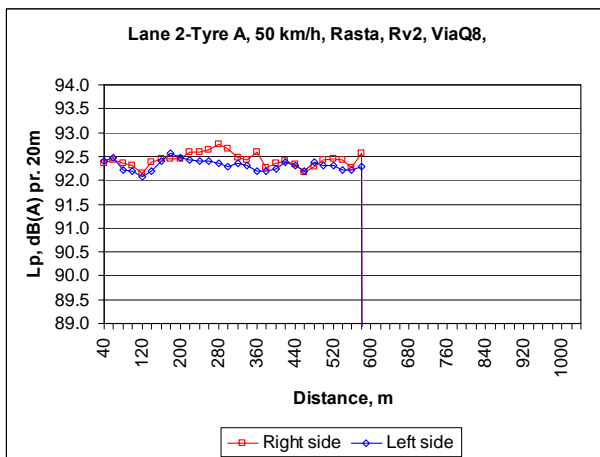
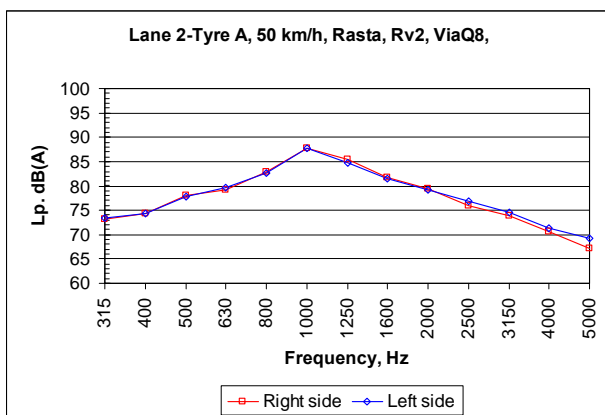
Lane 2-Tyre A, 50 km/h, Kongsvinger, Rasta, Rv2, ViaQ8,				
Total-average speed for dist. 0 - 600 m		51.4 km/h		
Std.dev.		0.42		
dBA / Distance	Air temp	15	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 600 m				
	90.2	89.9	89.9	89.6
Average for dist. 40 - 620 m			89.9	89.7
Std.dev.			0.32	0.19



2007:

Location	Rasta, Rv2
Road surface type	ViaQ8
Test section length	600
Direction	Lane 2
Date	25.06.2007
Air temperature	18
Road temperature	18

Lane 2-Tyre A, 50 km/h, Rasta, Rv2, ViaQ8,				
Total-average speed for dist. 0 - 580 m		50.7 km/h		
Std.dev.		0.30		
dBA / Distance	Air temp	18	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 580 m				
	92.5	92.4	92.4	92.3
Average for dist. 40 - 600 m				
			92.4	92.3
Std.dev.				
			0.15	0.11

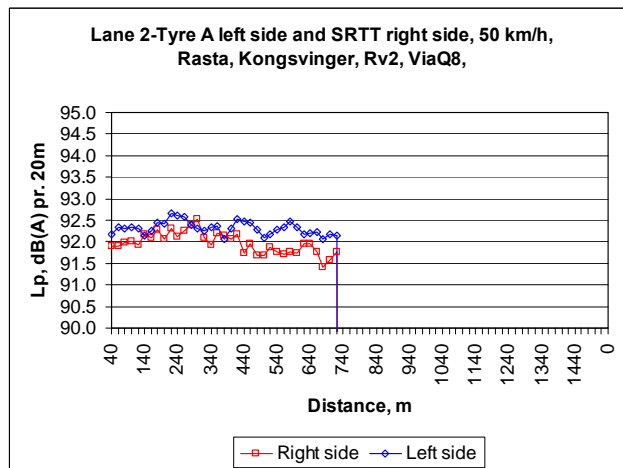
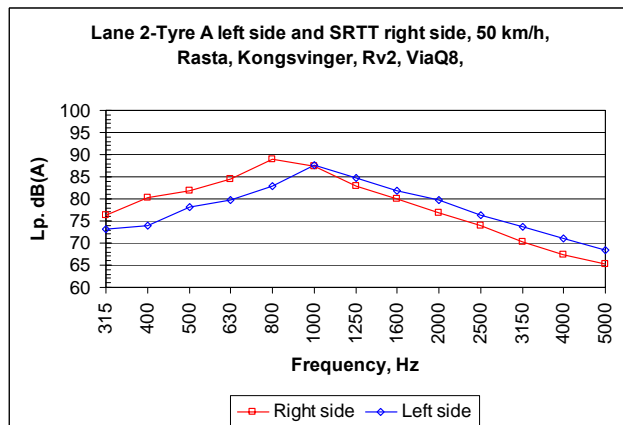


2008:

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Rasta, Kongsvinger, Rv2
Road surface type	ViaQ8
Test section length	720
Direction	Lane 2
Date	25.06.2008
Air temperature	21
Road temperature	32

Lane 2-Tyre A left side and SRTT right side, 50 km/h, Rasta, Kongsvin				
Total-average speed for dist. 0 - 720 m		52.7 km/h		
Std.dev.		1.56		
dBA / Distance	Air temp	21	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 720 m				
	91.9	92.2	91.9	92.3
Average for dist. 40 - 740 m				
			92.0	92.3
Std.dev.				
			0.24	0.15

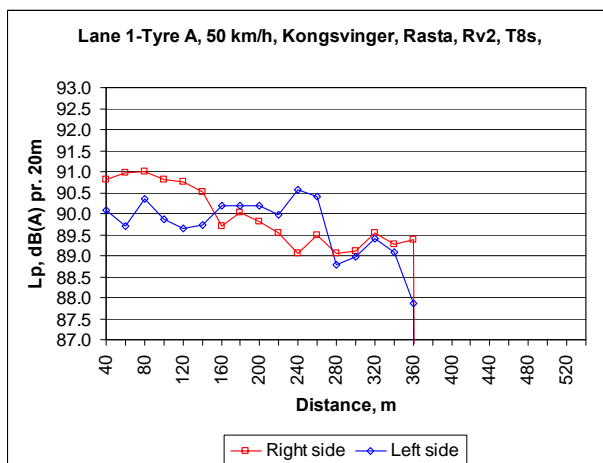
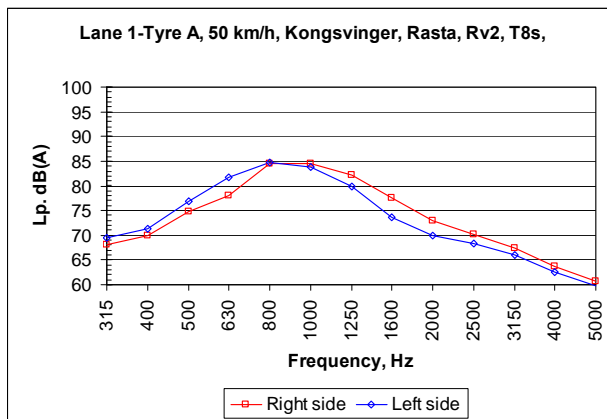


**Pavement 21: T8s. Rv2 - Rasta,  
lane 1, 50 km/h**

**2006:**

Location	Kongsvinger, Rasta, Rv2	
Road surface type	T8s	
Test section length	380	
Direction	Lane 1	
Date	10.10.2006	
Air temperature		15
Road temperature		13

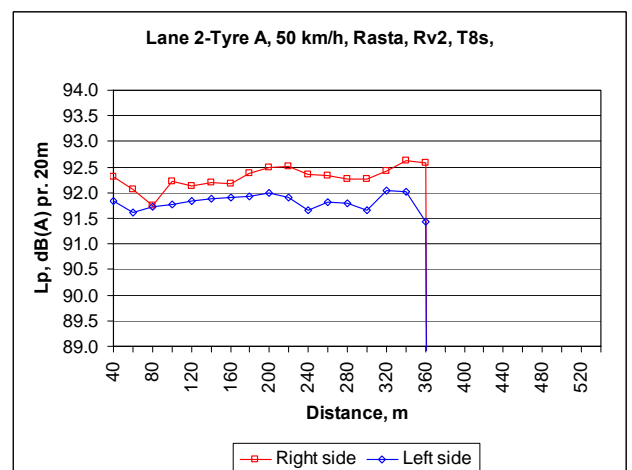
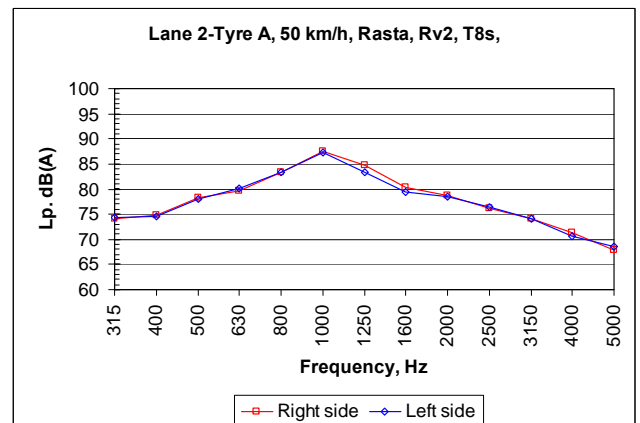
Lane 1-Tyre A, 50 km/h, Kongsvinger, Rasta, Rv2, T8s,				
Total-average speed for dist. 0 - 360 m		51.3 km/h		
Std.dev.		0.18		
dBA / Distance	Air temp	15	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 360 m			
	90.4	90.0	90.1	89.7
Average	for dist. 40 - 380 m			
Std.dev.			0.72	0.70



**2007:**

Location	Rasta, Rv2	
Road surface type	T8s	
Test section length	360	
Direction	Lane 1	
Date	25.06.2007	
Air temperature		18
Road temperature		18

Lane 2-Tyre A, 50 km/h, Rasta, Rv2, T8s,				
Total-average speed for dist. 0 - 360 m		50.5 km/h		
Std.dev.		0.30		
dBA / Distance	Air temp	18	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 360 m			
	92.4	91.9	92.3	91.8
Average	for dist. 40 - 380 m			
Std.dev.			0.21	0.16



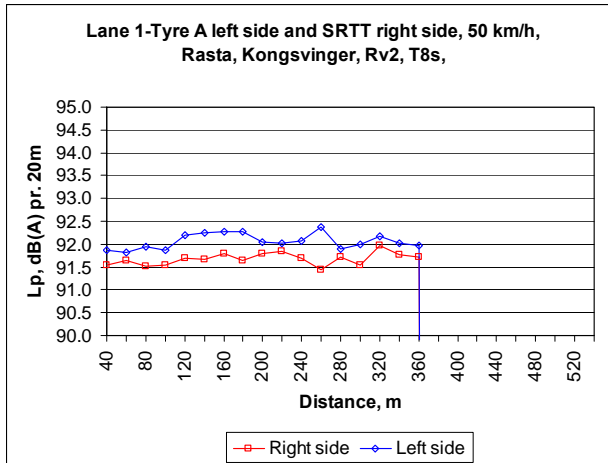
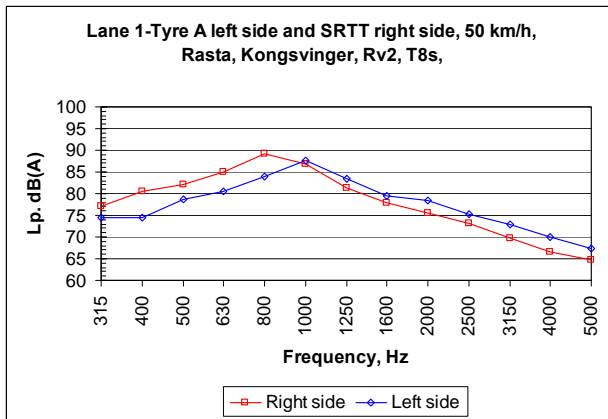


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Rasta, Kongsvinger, Rv2
Road surface type	T8s
Test section length	360
Direction	Lane 1
Date	25.06.2008
Air temperature	21
Road temperature	32

Lane 1-Tyre A left side and SRTT right side, 50 km/h, Rasta, Kongsvinger, Rv2, T8s				
Total-average speed for dist. 0 - 360 m		51.5 km/h		
Std.dev.		0.36		
dB(A) / Distance	Air temp Right s	21 Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 360 m		91.6	92.0	
Average for dist. 40 - 380 m			91.7	92.1
Std.dev.			0.14	0.17

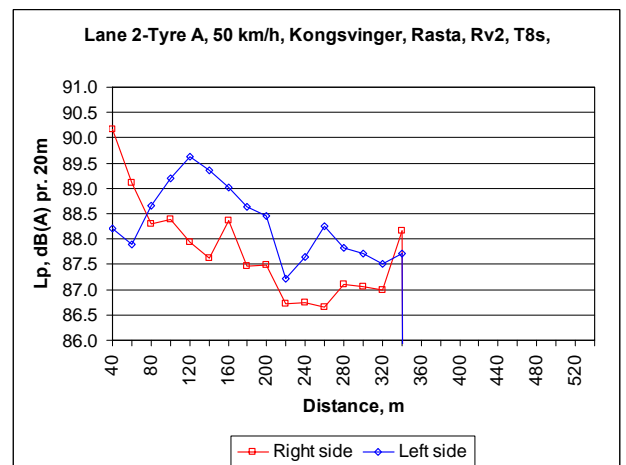
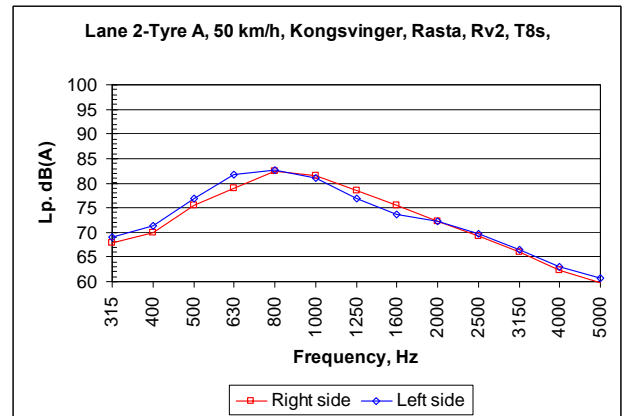


**Pavement 21: T8s. Rv2 - Rasta, lane 2, 50 km/h**

**2006:**

Location	Kongsvinger, Rasta, Rv2
Road surface type	T8s
Test section length	340
Direction	Lane 2
Date	10.10.2006
Air temperature	15
Road temperature	13

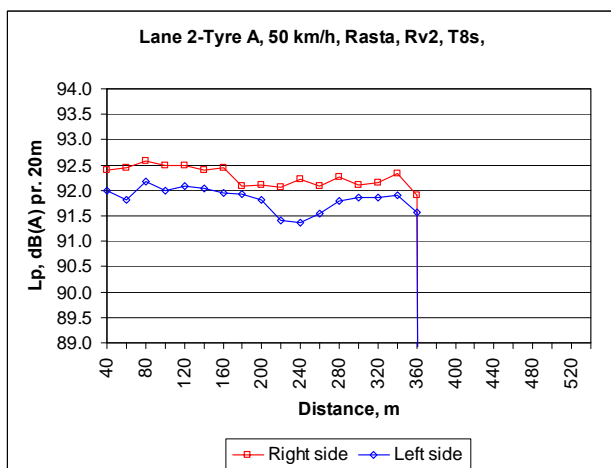
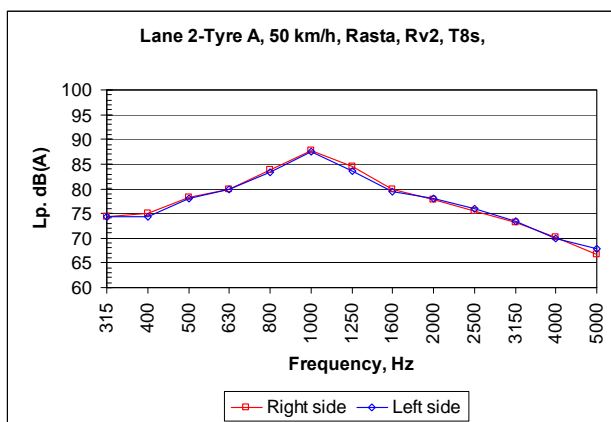
Lane 2-Tyre A, 50 km/h, Kongsvinger, Rasta, Rv2, T8s,				
Total-average speed for dist. 0 - 340 m		51.3 km/h		
Std.dev.		0.12		
dB(A) / Distance	Air temp Right s	15 Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 340 m		88.4	88.7	
Average for dist. 40 - 360 m			88.1	88.4
Std.dev.			0.96	0.72



**2007:**

Location	Rasta, Rv2
Road surface type	T8s
Test section length	360
Direction	Lane 2
Date	25.06.2007
Air temperature	18
Road temperature	18

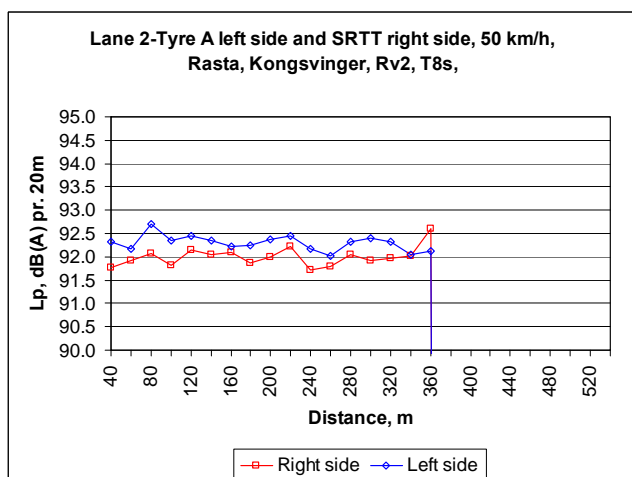
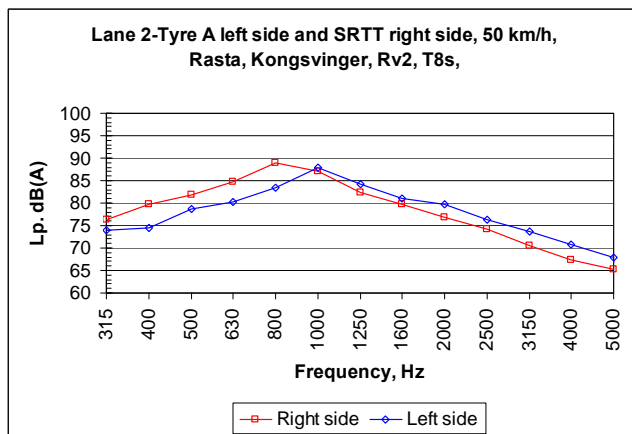
Lane 2-Tyre A, 50 km/h, Rasta, Rv2, T8s,				
Total-average speed for dist. 0 - 360 m		50.7 km/h		
Std.dev.		0.12		
dBA / Distance	Air temp	18	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 360 m				
	92.4	92.0	92.3	91.9
Average for dist. 40 - 380 m				
			92.3	91.8
Std.dev.				
			0.20	0.23


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Rasta, Kongsvinger, Rv2
Road surface type	T8s
Test section length	360
Direction	Lane 2
Date	25.06.2008
Air temperature	21
Road temperature	32

Lane 2-Tyre A left side and SRTT right side, 50 km/h, Rasta, Kongsvin				
Total-average speed for dist. 0 - 360 m		50.0 km/h		
Std.dev.		0.24		
dBA / Distance	Air temp	21	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 360 m				
	92.0	92.4	92.0	92.5
Average for dist. 40 - 380 m				
			92.0	92.3
Std.dev.				
			0.21	0.17

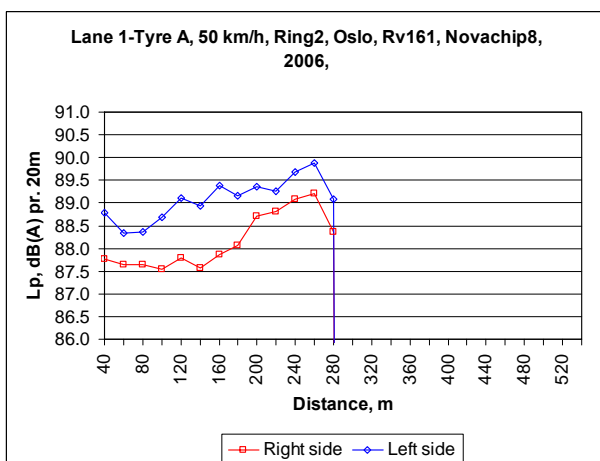
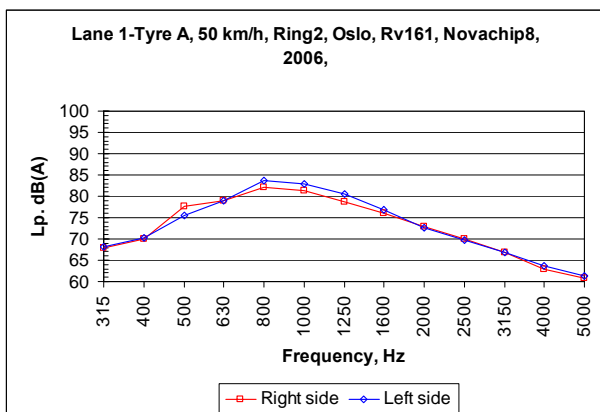


### Pavement 22: Novachip8. Rv161 - Oslo, lane 1, 50 km/h

**2006:**

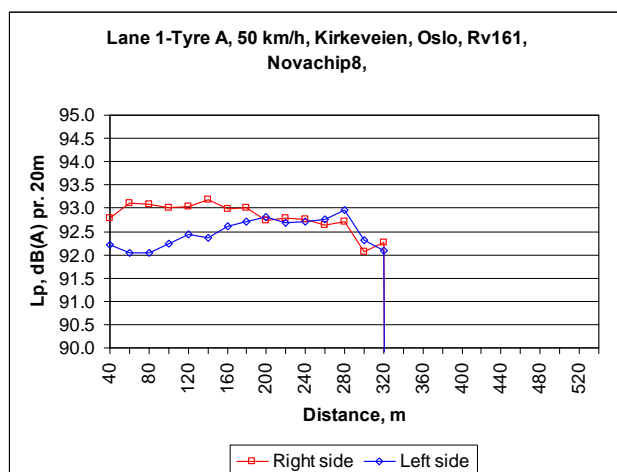
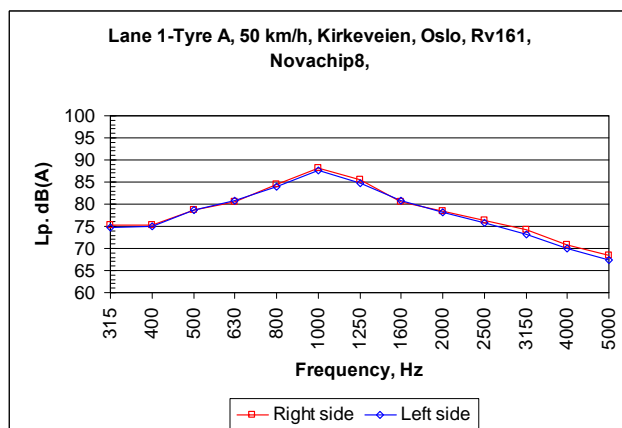
Location	Ring2, Oslo, Rv161
Road surface type	Novachip8, 2006
Test section length	300
Direction	Lane 1
Date	11.10.2006
Air temperature	12
Road temperature	8

Lane 1-Tyre A, 50 km/h, Ring2, Oslo, Rv161, Novachip8, 2006,				
Total-average speed for dist. 0 - 280 m		51.0		km/h
Std.dev.		0.73		
dBA / Distance	Air temp Right s	12 Left s	Temp.corr. to +20C	
			Right side	Left side
Total-average for dist. 0 - 280 m				
	88.4	89.5	87.9	89.0
Average for dist. 40 - 300 m				
			88.2	89.1
Std.dev.				
			0.60	0.46


**2007:**

Location	Kirkeveien, Oslo, Rv161
Road surface type	Novachip8
Test section length	320
Direction	Lane 1
Date	20.09.2007
Air temperature	12
Road temperature	10

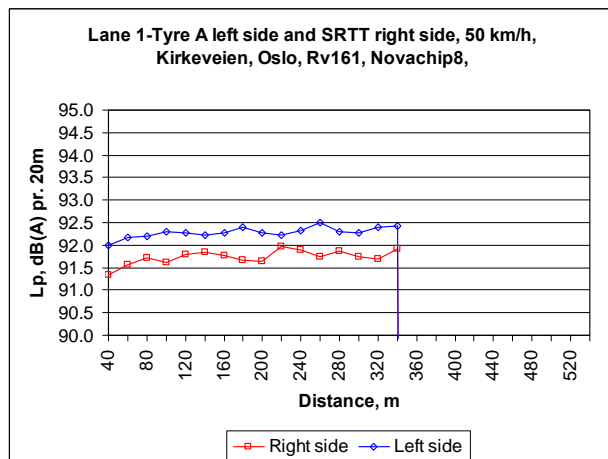
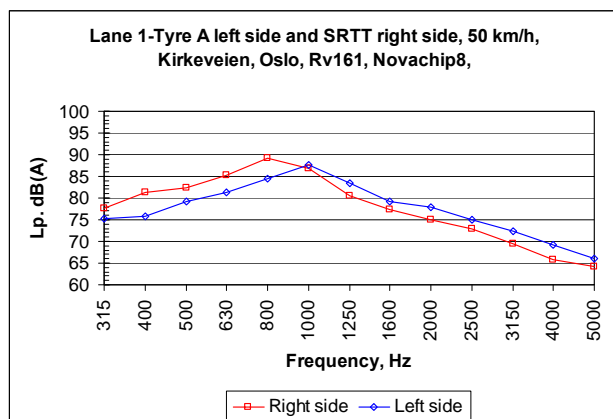
Lane 1-Tyre A, 50 km/h, Kirkeveien, Oslo, Rv161, Novachip8,				
Total-average speed for dist. 0 - 320 m		50.1		km/h
Std.dev.		1.24		
dBA / Distance	Air temp Right s	12 Left s	Temp.corr. to +20C	
			Right side	Left side
<k for dist. 0 - 320 m				
	93.3	93.0	92.9	92.5
Average for dist. 40 - 340 m				
			92.8	92.5
Std.dev.				
			0.31	0.30



**2008:**
*(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)*

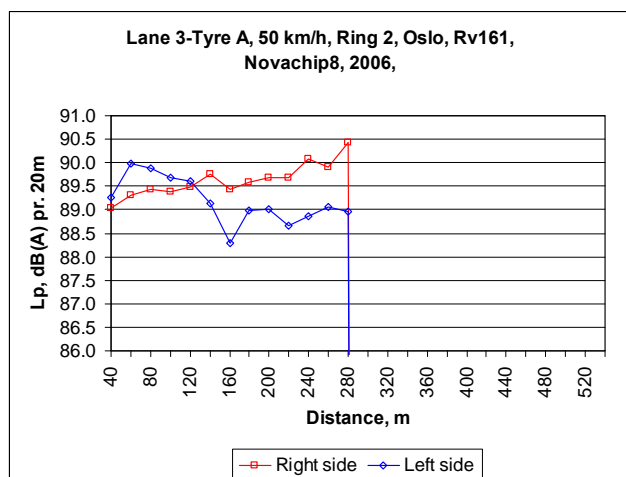
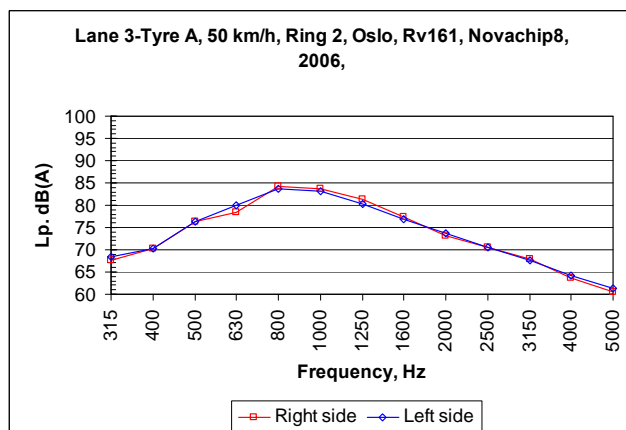
Location	Kirkeveien, Oslo, Rv161
Road surface type	Novachip8
Test section length	340
Direction	Lane 1
Date	25.06.2008
Air temperature	16
Road temperature	17

Lane 1-Tyre A left side and SRTT right side, 50 km/h, Kirkeveien, Oslo				
Total-average speed for dist. 0 - 340 m		51.2 km/h		
Std.dev.		0.86		
dBA / Distance	Air temp Right s	16 Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 340 m				
	92.0	92.5	91.7	92.3
Average for dist. 40 - 360 m				
			91.7	92.3
Std.dev.				
			0.16	0.12


**Pavement 22: Novachip8. Rv161 - Oslo, lane 3, 50 km/h**
**2006:**

Location	Ring 2, Oslo, Rv161
Road surface type	Novachip8, 2006
Test section length	280
Direction	Lane 3, Public transport
Date	11.10.2006
Air temperature	12
Road temperature	8

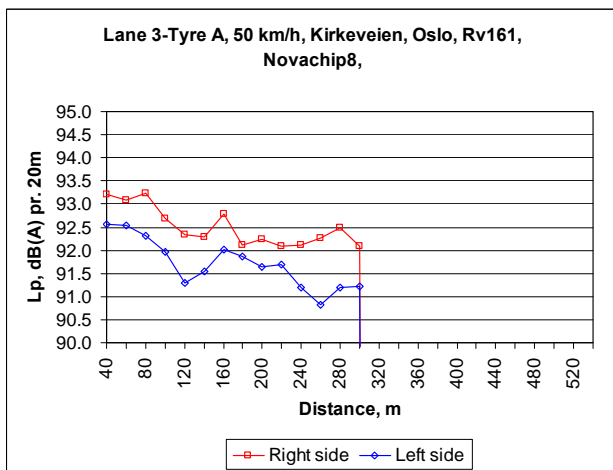
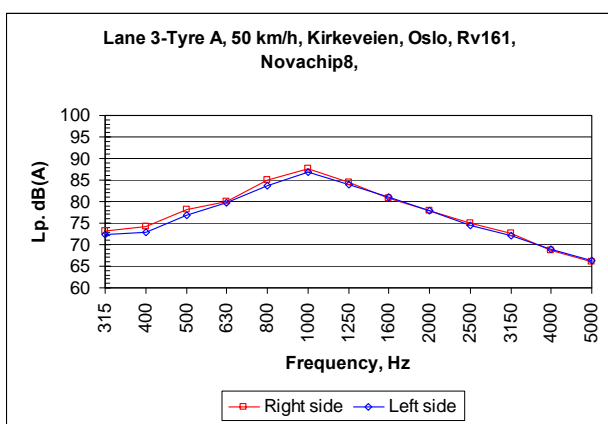
Lane 3-Tyre A, 50 km/h, Ring 2, Oslo, Rv161, Novachip8, 2006,				
Total-average speed for dist. 0 - 280 m		51.1 km/h		
Std.dev.		0.97		
dBA / Distance	Air temp Right s	12 Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 280 m				
	90.1	89.8	89.6	89.3
Average for dist. 40 - 300 m				
			89.6	89.2
Std.dev.				
			0.36	0.49



**2007:**

Location	Kirkeveien, Oslo, Rv161
Road surface type	Novachip8
Test section length	300
Direction	Lane 3 Public transport
Date	20.09.2007
Air temperature	12
Road temperature	10

Lane 3-Tyre A, 50 km/h, Kirkeveien, Oslo, Rv161, Novachip8,				
Total-average speed for dist. 0 - 300 m		50.2 km/h		
Std.dev.		1.21		
dBA / Distance	Air temp	12 Right s	12 Left s	Temp.corr. to +20C
				Right side Left side
<k for dist. 0 - 300 m				
		93.0	92.2	92.5 91.7
Average for dist. 40 - 320 m				
Std.dev.				
		0.43	0.53	

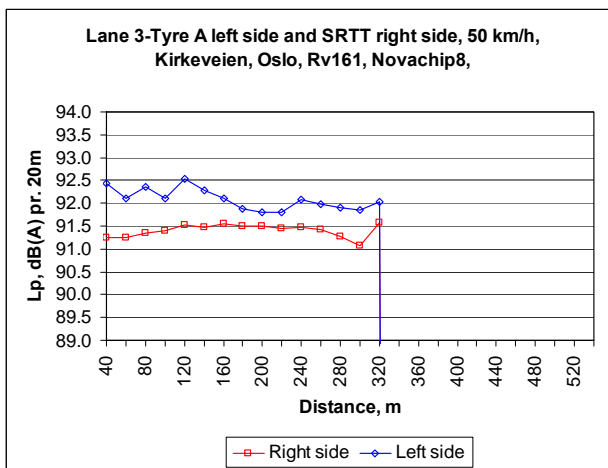
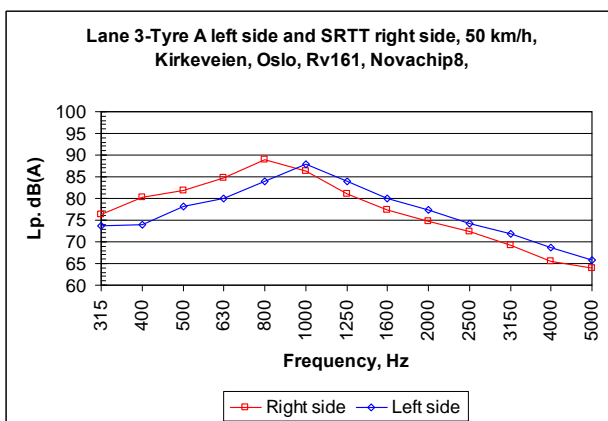


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Kirkeveien, Oslo, Rv161
Road surface type	Novachip8
Test section length	280
Direction	Lane 3 Public transport
Date	25.06.2008
Air temperature	16
Road temperature	17

Lane 3-Tyre A left side and SRTT right side, 50 km/h, Kirkeveien, Oslo,				
Total-average speed for dist. 0 - 320 m		50.2 km/h		
Std.dev.		1.15		
dBA / Distance	Air temp	16 Right s	16 Left s	Temp.corr. to +20C
				Right side Left side
Total-average for dist. 0 - 320 m				
		91.6	92.4	91.4 92.1
Average for dist. 40 - 340 m				
Std.dev.				
		0.14	0.23	

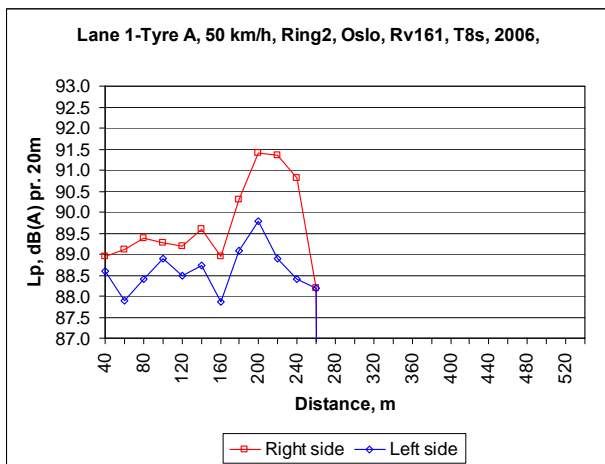
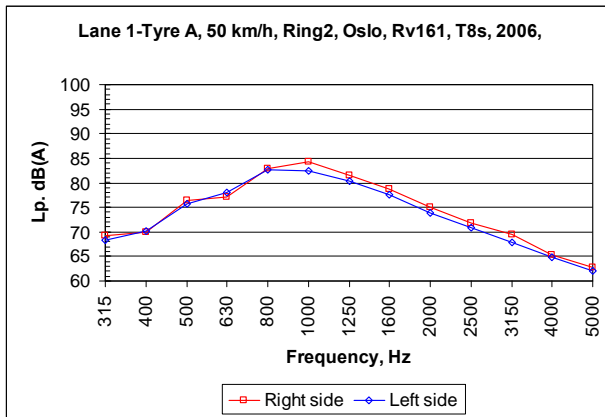


**Pavement 23: T8s, Rv161 - Oslo, lane 1, 50 km/h**

**2006:**

Location	Ring2, Oslo, Rv161
Road surface type	T8s, 2006
Test section length	250
Direction	Lane 1
Date	11.10.2006
Air temperature	12
Road temperature	8

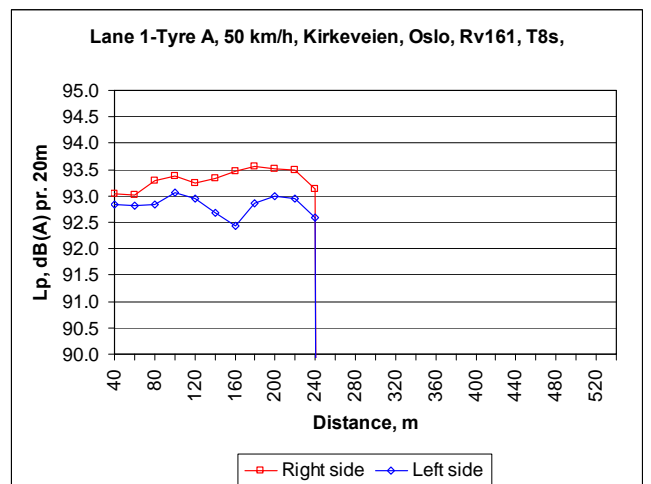
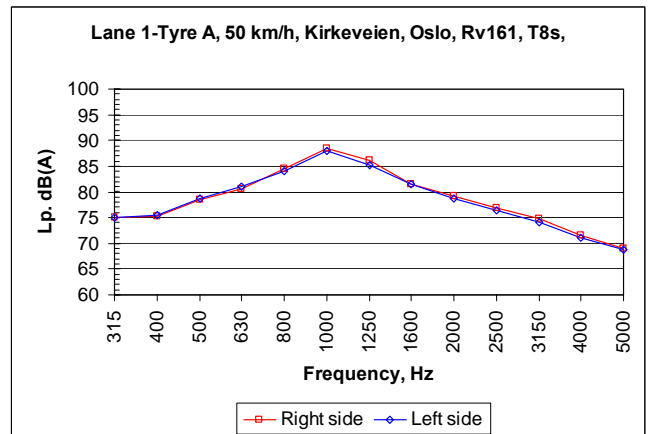
Lane 1-Tyre A, 50 km/h, Ring2, Oslo, Rv161, T8s, 2006,					
Total-average speed for dist. 0 - 260 m		50.7 km/h			
Std.dev.		0.44			
dBA / Distance	Air temp	12 Right s	12 Left s	Temp.corr. to +20C Right side	Temp.corr. to +20C Left side
Total-average for dist. 0 - 260 m					
	90.0	89.2		89.6	88.7
Average for dist. 40 - 280 m					
				89.7	88.6
Std.dev.		1.02			0.53



**2007:**

Location	Kirkeveien, Oslo, Rv161
Road surface type	T8s
Test section length	240
Direction	Lane 1
Date	20.09.2007
Air temperature	12
Road temperature	10

Lane 1-Tyre A, 50 km/h, Kirkeveien, Oslo, Rv161, T8s,					
Total-average speed for dist. 0 - 240 m		49.0 km/h			
Std.dev.		0.56			
dBA / Distance	Air temp	12 Right s	12 Left s	Temp.corr. to +20C Right side	Temp.corr. to +20C Left side
<k for dist. 0 - 240 m					
	93.6	93.3		93.1	92.8
Average for dist. 40 - 260 m					
				93.3	92.8
Std.dev.		0.19			0.19

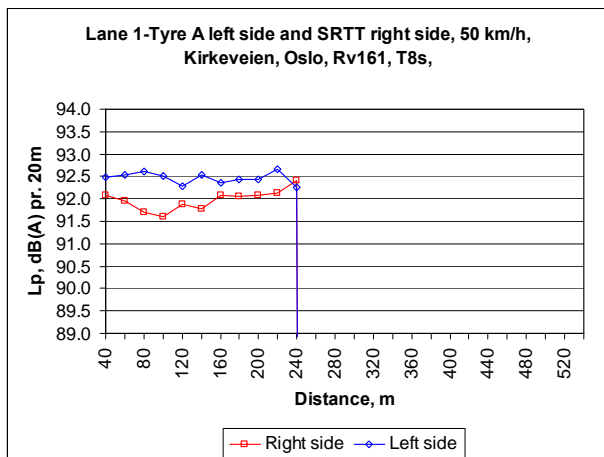
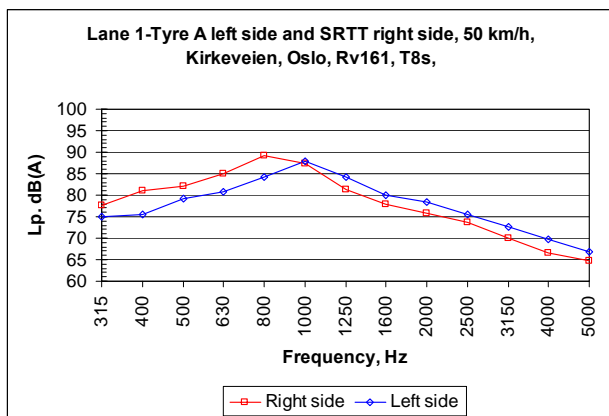


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Kirkeveien, Oslo, Rv161
Road surface type	T8s
Test section length	240
Direction	Lane 1
Date	25.06.2008
Air temperature	16
Road temperature	17

Lane 1-Tyre A left side and SRTT right side, 50 km/h, Kirkeveien, Oslo,				
Total-average speed for dist. 0 - 240 m				
49.9 km/h				
Std.dev.				
0.96				
dBA / Distance	Air temp	16	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 240 m				
92.2 92.7				
Average for dist. 40 - 260 m				
92.0 92.5				
Std.dev.				
0.23 0.13				

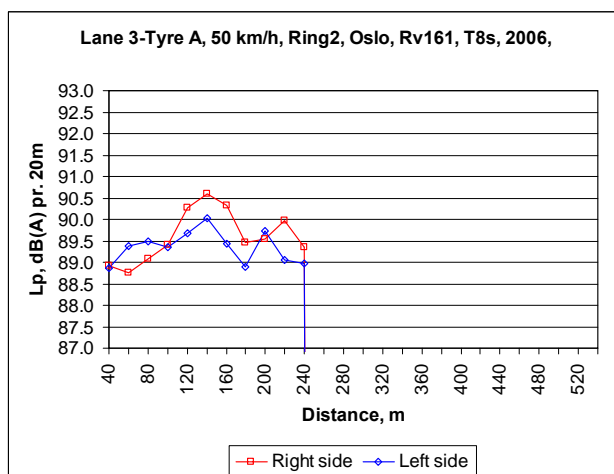
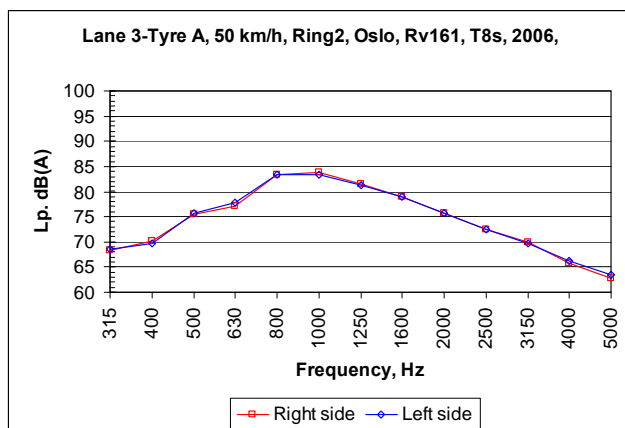


**Pavement 23: T8s. Rv161 - Oslo, lane 3, 50 km/h**

**2006:**

Location	Ring2, Oslo, Rv161
Road surface type	T8s, 2006
Test section length	240
Direction	Lane 3, Public transport
Date	11.10.2006
Air temperature	12
Road temperature	8

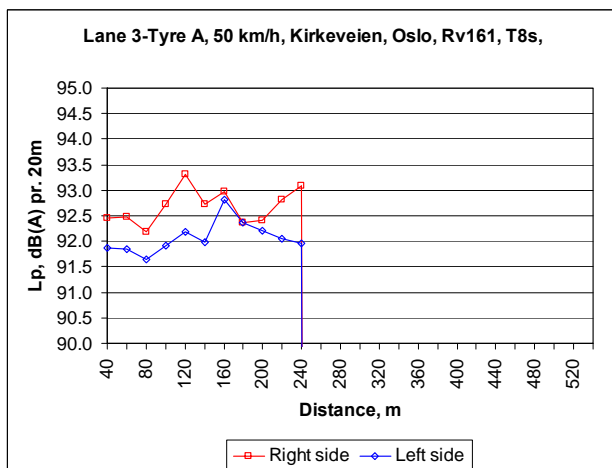
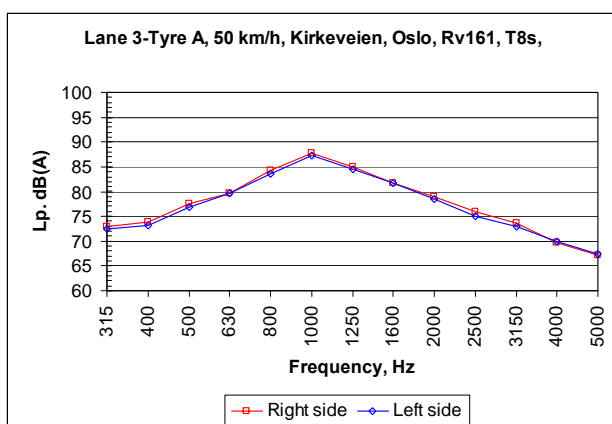
Lane 3-Tyre A, 50 km/h, Ring2, Oslo, Rv161, T8s, 2006,				
Total-average speed for dist. 0 - 240 m				
50.4 km/h				
Std.dev.				
0.43				
dBA / Distance	Air temp	12	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 240 m				
90.2 90.0				
Average for dist. 40 - 260 m				
89.8 89.6				
Std.dev.				
0.60 0.37				



**2007:**

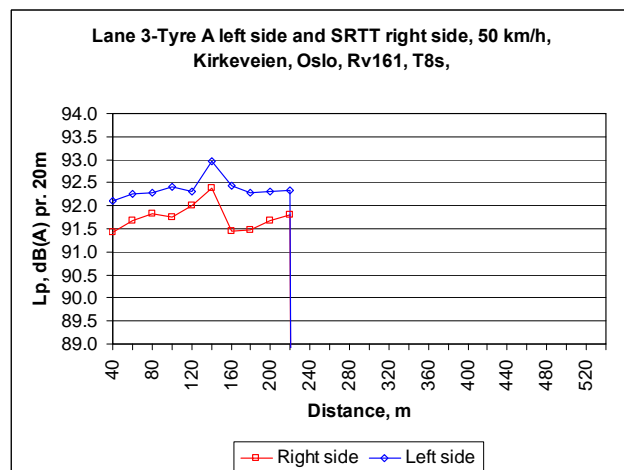
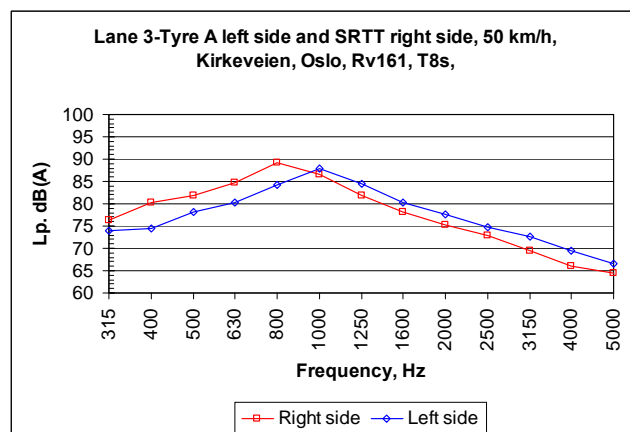
Location	Kirkeveien, Oslo, Rv161
Road surface type	T8s
Test section length	240
Direction	Lane 3 Public transport
Date	20.09.2007
Air temperature	12
Road temperature	10

Lane 3-Tyre A, 50 km/h, Kirkeveien, Oslo, Rv161, T8s,				
Total-average speed for dist. 0 - 240 m		49.7 km/h		
Std.dev.		0.74		
dBA / Distance	Air temp	12	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 240 m				
	93.1	92.6	92.6	92.1
Average	for dist. 40 - 260 m		92.7	92.1
Std.dev.			0.34	0.31


**2008:**
*(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)*

Location	Kirkeveien, Oslo, Rv161
Road surface type	T8s
Test section length	220
Direction	Lane 3 Public transport
Date	25.06.2008
Air temperature	16
Road temperature	17

Lane 3-Tyre A left side and SRTT right side, 50 km/h, Kirkeveien, Oslo, Rv161, T8s,				
Total-average speed for dist. 0 - 220 m		49.1 km/h		
Std.dev.		0.46		
dBA / Distance	Air temp	16	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 220 m				
	91.9	92.7	91.7	92.4
Average	for dist. 40 - 240 m		91.7	92.4
Std.dev.			0.29	0.23



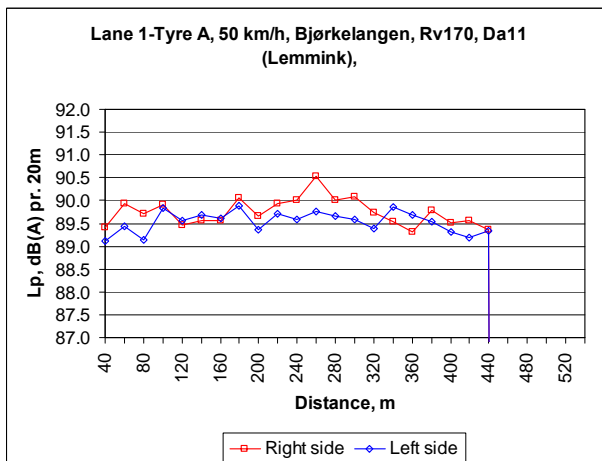
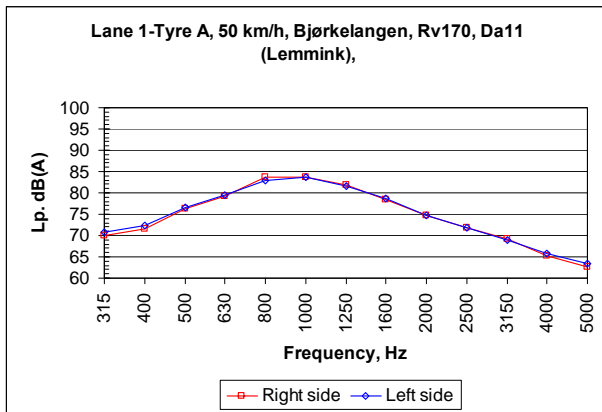


**Pavement 24: Da11. Rv170 - Bjørkelangen, lane 1, 50 km/h**

**2006:**

Location	Bjørkelangen, Rv170
Road surface type	Da11 (Lemmink)
Test section length	440
Direction	Lane 1
Date	10.10.2006
Air temperature	10
Road temperature	6

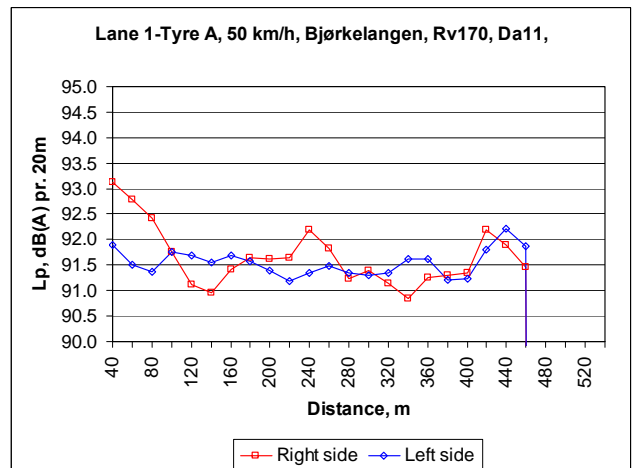
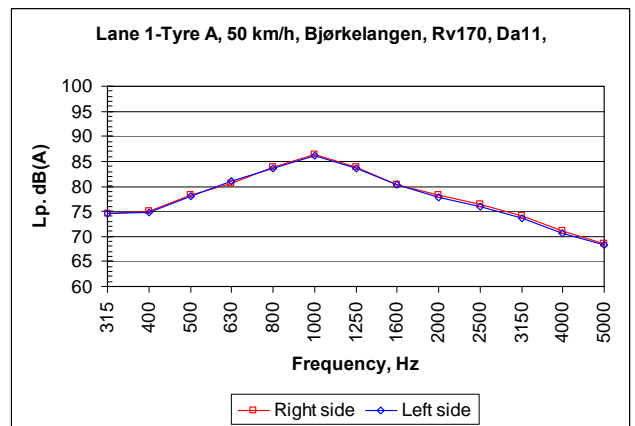
Lane 1-Tyre A, 50 km/h, Bjørkelangen, Rv170, Da11 (Lemmink),				
Total-average speed for dist. 0 - 440 m		50.8 km/h		
Std.dev.		0.49		
dBA / Distance	Air temp	10	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 440 m				
			89.7	89.6
Average for dist. 40 - 460 m				
			89.7	89.5
Std.dev.				
			0.30	0.23



**2007:**

Location	Bjørkelangen, Rv170
Road surface type	Da11
Test section length	460
Direction	Lane 1
Date	19.09.2007
Air temperature	11
Road temperature	14

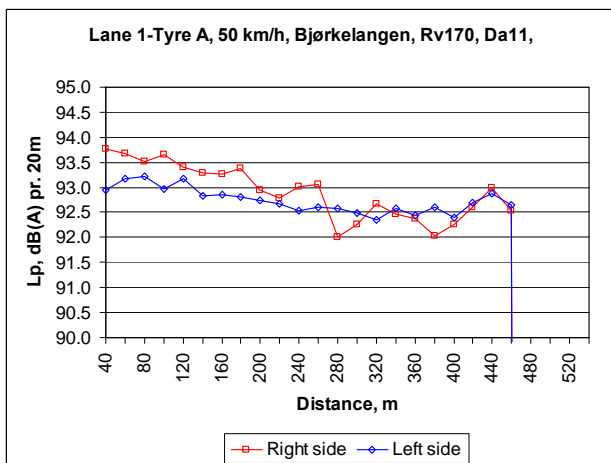
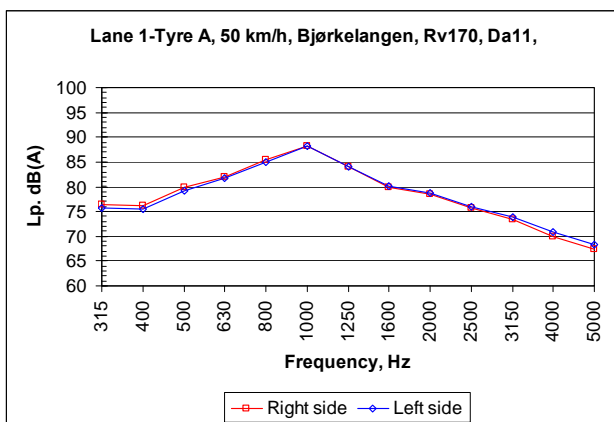
Lane 1-Tyre A, 50 km/h, Bjørkelangen, Rv170, Da11,				
Total-average speed for dist. 0 - 460 m		49.7 km/h		
Std.dev.		0.48		
dBA / Distance	Air temp	11	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 460 m				
			91.9	91.6
Average for dist. 40 - 480 m				
			91.7	91.5
Std.dev.				
			0.58	0.26



**2008:**

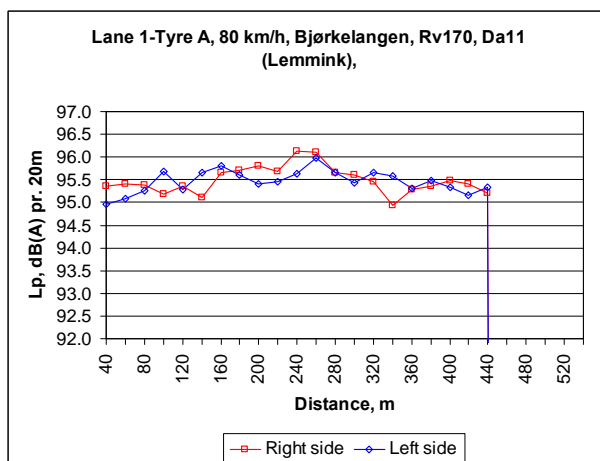
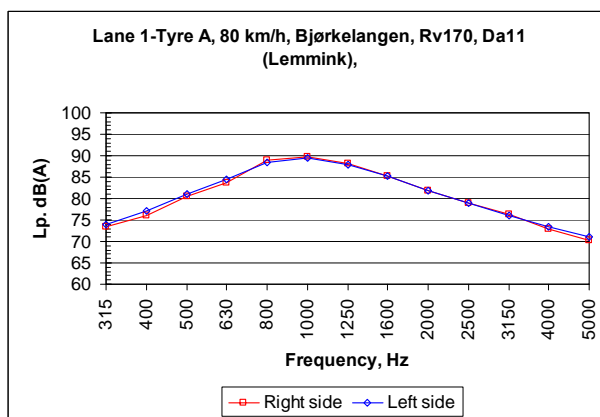
Location	Bjørkelangen, Rv170
Road surface type	Da11
Test section length	460
Direction	Lane 1
Date	24.06.2008
Air temperature	25
Road temperature	29

Lane 1-Tyre A, 50 km/h, Bjørkelangen, Rv170, Da11,				
Total-average speed for dist. 0 - 460 m		51.5		km/h
Std.dev.		0.77		
dBA / Distance	Air temp	25	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 460 m		93.0	92.8
	92.8	92.6		
Average	for dist. 40 - 480 m		92.9	92.7
Std.dev.			0.54	0.25


**Pavement 24: Da11. Rv170 - Bjørkelangen, lane 1, 80 km/h**
**2006:**

Location	Bjørkelangen, Rv170
Road surface type	Da11 (Lemmink)
Test section length	440
Direction	Lane 1
Date	10.10.2006
Air temperature	10
Road temperature	6

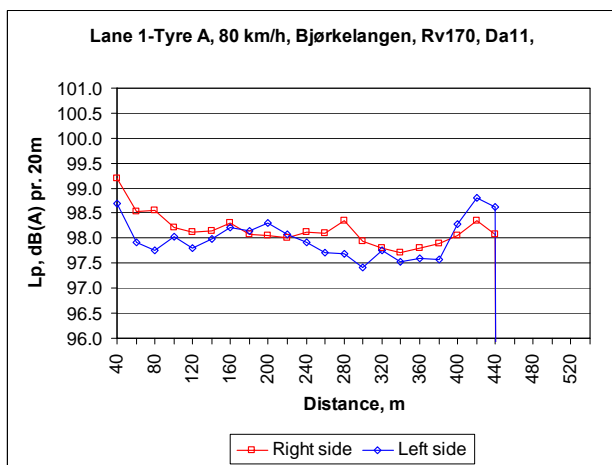
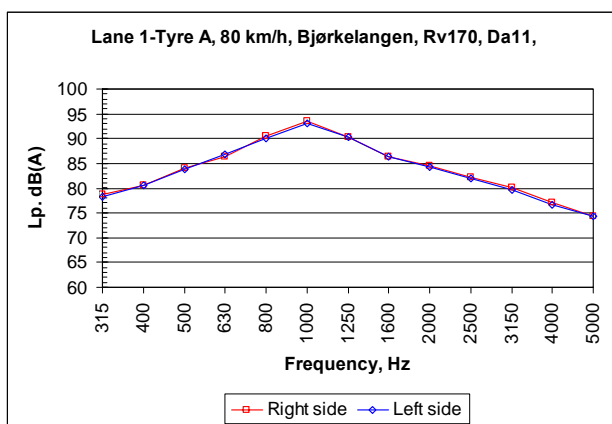
Lane 1-Tyre A, 80 km/h, Bjørkelangen, Rv170, Da11 (Lemmink),				
Total-average speed for dist. 0 - 440 m		81.0		km/h
Std.dev.		0.58		
dBA / Distance	Air temp	10	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 440 m		95.5	95.4
	95.8	95.7		
Average	for dist. 40 - 460 m		95.5	95.5
Std.dev.			0.30	0.25



**2007:**

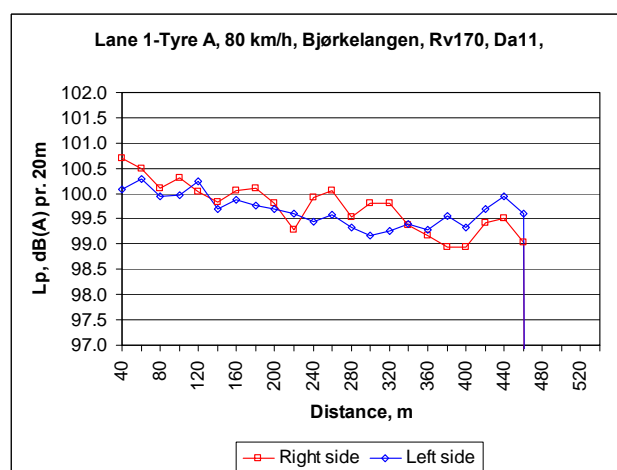
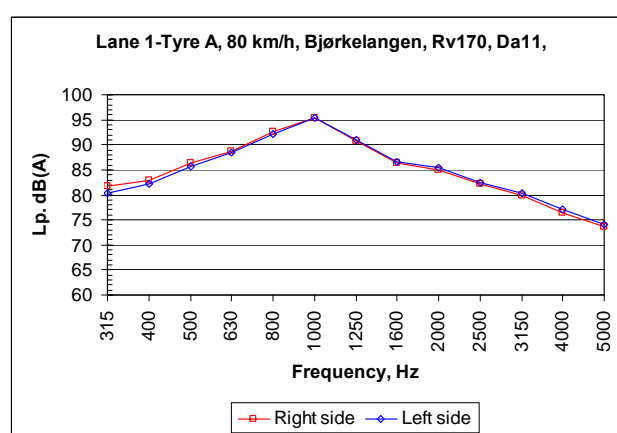
Location	Bjørkelangen, Rv170
Road surface type	Da11
Test section length	440
Direction	Lane 1
Date	19.09.2007
Air temperature	11
Road temperature	14

Lane 1-Tyre A, 80 km/h, Bjørkelangen, Rv170, Da11,				
Total-average speed for dist. 0 - 440 m		80.5 km/h		
Std.dev.		0.62		
dBA / Distance	Air temp Right s	Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 440 m				
	98.6	98.3	98.3	98.1
Average for dist. 40 - 460 m				
			98.2	98.0
Std.dev.				
			0.32	0.39


**2008:**

Location	Bjørkelangen, Rv170
Road surface type	Da11
Test section length	460
Direction	Lane 1
Date	24.06.2008
Air temperature	25
Road temperature	29

Lane 1-Tyre A, 80 km/h, Bjørkelangen, Rv170, Da11,				
Total-average speed for dist. 0 - 460 m		80.5 km/h		
Std.dev.		0.52		
dBA / Distance	Air temp Right s	Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 460 m				
	99.7	99.6	99.9	99.7
Average for dist. 40 - 480 m				
			99.7	99.7
Std.dev.				
			0.49	0.32

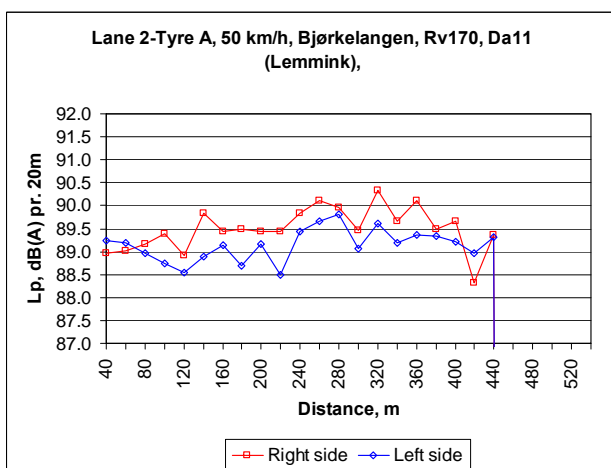
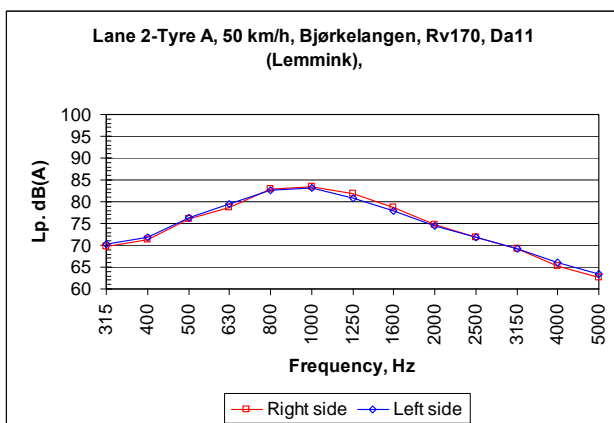


**Pavement 24: Da11. Rv170 - Bjørkelangen, lane 2, 50 km/h**

**2006:**

Location	<b>Bjørkelangen, Rv170</b>
Road surface type	<b>Da11 (Lemmink)</b>
Test section length	450
Direction	Lane 2
Date	10.10.2006
Air temperature	10
Road temperature	6

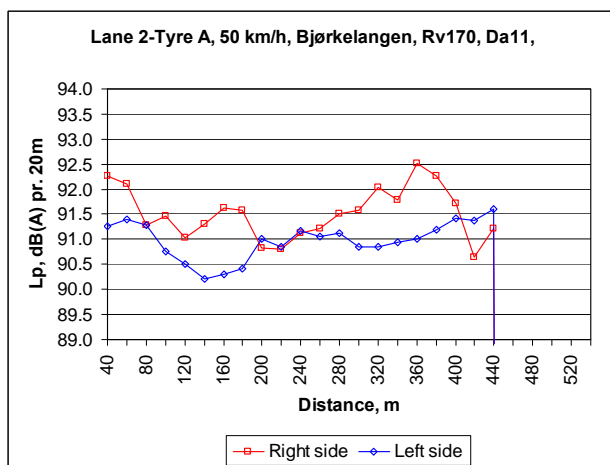
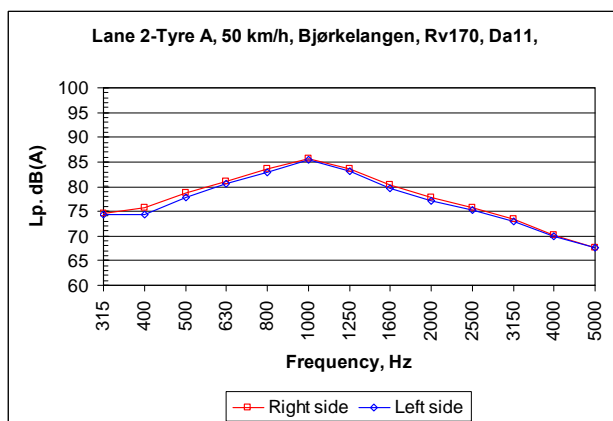
Lane 2-Tyre A, 50 km/h, Bjørkelangen, Rv170, Da11 (Lemmink),				
Total-average speed for dist. 0 - 440 m		50.8 km/h		
Std.dev.		0.41		
dBA / Distance	Air temp 10		Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 440 m		89.4	89.1
Average	for dist. 40 - 460 m		89.5	89.1
Std.dev.			0.47	0.35



**2007:**

Location	<b>Bjørkelangen, Rv170</b>
Road surface type	<b>Da11</b>
Test section length	440
Direction	Lane 2
Date	19.09.2007
Air temperature	11
Road temperature	14

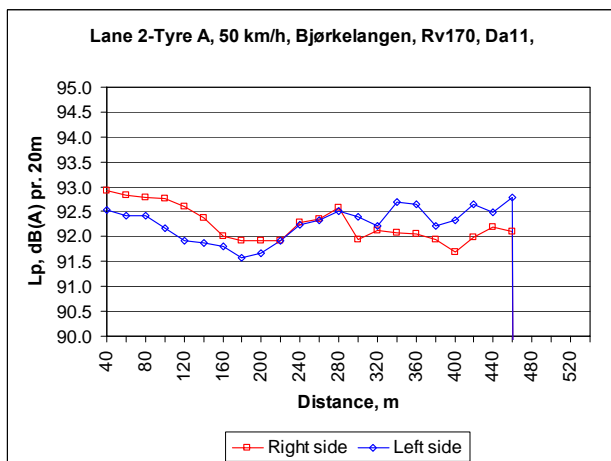
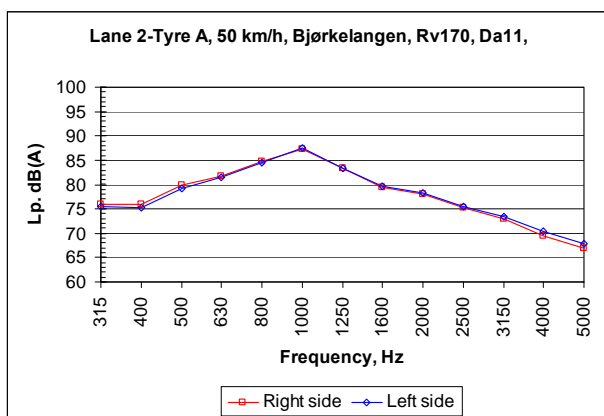
Lane 2-Tyre A, 50 km/h, Bjørkelangen, Rv170, Da11,				
Total-average speed for dist. 0 - 440 m		49.8 km/h		
Std.dev.		0.45		
dBA / Distance	Air temp 11		Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 440 m		91.5	90.9
Average	for dist. 40 - 460 m		91.5	91.0
Std.dev.			0.51	0.38



2008:

Location	Bjørkelangen, Rv170
Road surface type	Da11
Test section length	460
Direction	Lane 2
Date	24.06.2008
Air temperature	25
Road temperature	29

Lane 2-Tyre A, 50 km/h, Bjørkelangen, Rv170, Da11,				
Total-average speed for dist. 0 - 460 m		51.2 km/h		
Std.dev.		1.09		
dBA / Distance	Air temp	25	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 460 m			
	92.1	92.1	92.3	92.3
Average	for dist. 40 - 480 m		92.2	92.3
Std.dev.			0.36	0.34

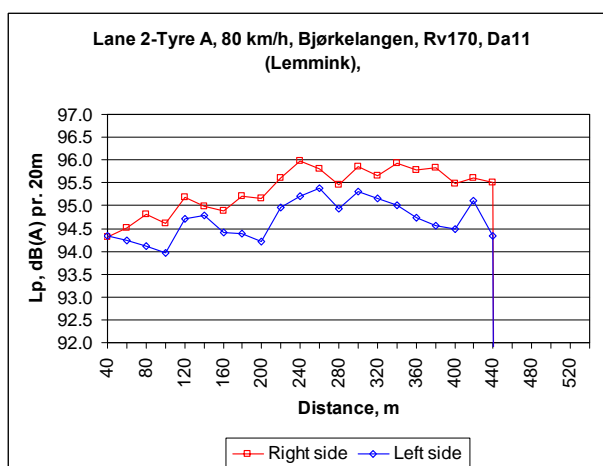
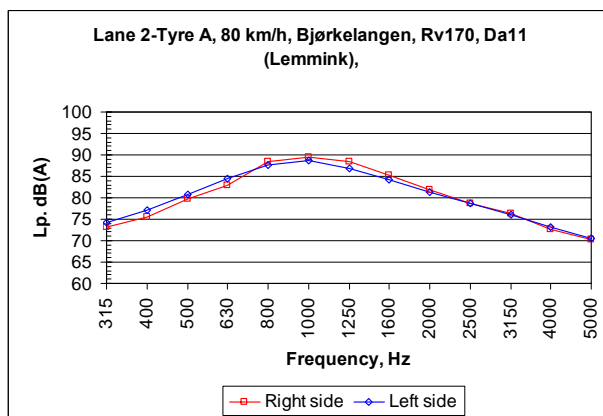


### Pavement 24: Da11. Rv170 - Bjørkelangen, lane 2, 80 km/h

2006:

Road surface type	Da11 (Lemmink)
Test section length	440
Direction	Lane 2
Date	10.10.2006
Air temperature	10
Road temperature	6

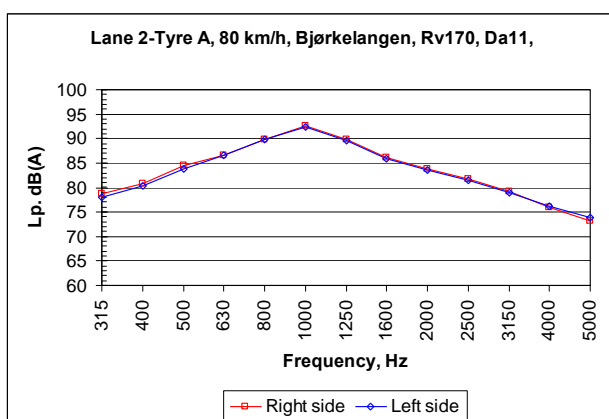
Lane 2-Tyre A, 80 km/h, Bjørkelangen, Rv170, Da11 (Lemmink),				
Total-average speed for dist. 0 - 440 m		81.0 km/h		
Std.dev.		0.56		
dBA / Distance	Air temp	10	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 440 m			
	95.5	94.9	95.2	94.6
Average	for dist. 40 - 460 m		95.3	94.7
Std.dev.			0.50	0.42



**2007:**

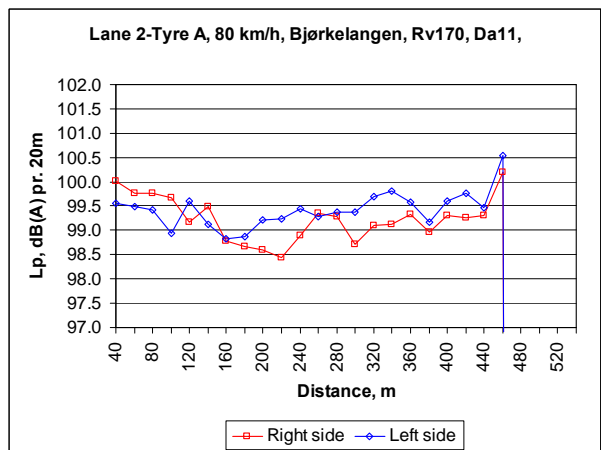
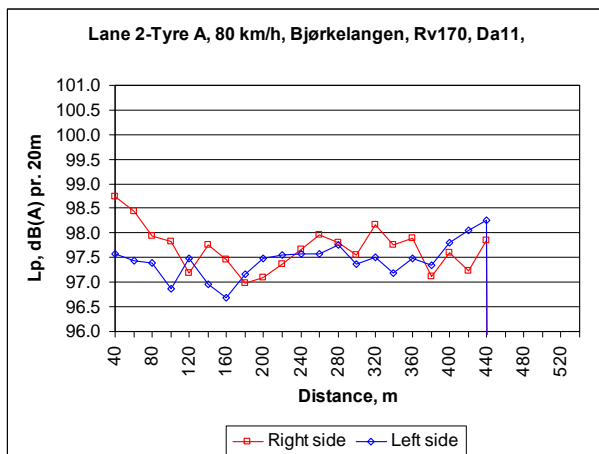
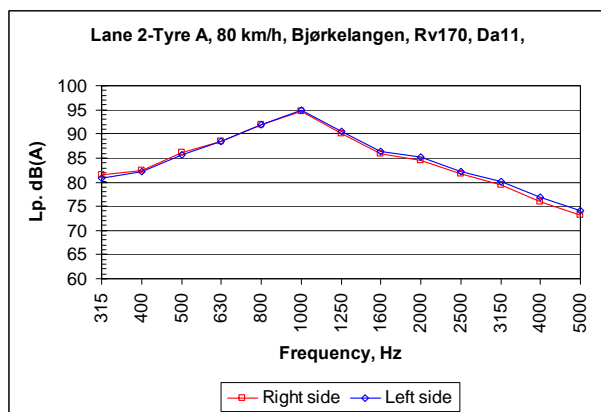
Location	Bjørkelangen, Rv170
Road surface type	Da11
Test section length	440
Direction	Lane 2
Date	19.09.2007
Air temperature	11
Road temperature	14

Lane 2-Tyre A, 80 km/h, Bjørkelangen, Rv170, Da11,				
Total-average speed for dist. 0 - 440 m		80.6 km/h		
Std.dev.		0.57		
dBA / Distance	Air temp	11	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 440 m				
	98.0	97.7	97.7	97.5
Average for dist. 40 - 460 m				
			97.7	97.5
Std.dev.		0.44 0.36		


**2008:**

Location	Bjørkelangen, Rv170
Road surface type	Da11
Test section length	460
Direction	Lane 2
Date	24.06.2008
Air temperature	25
Road temperature	29

Lane 2-Tyre A, 80 km/h, Bjørkelangen, Rv170, Da11,				
Total-average speed for dist. 0 - 460 m		82.1 km/h		
Std.dev.		0.88		
dBA / Distance	Air temp	25	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 460 m				
	99.1	99.3	99.2	99.4
Average for dist. 40 - 480 m				
			99.2	99.4
Std.dev.		0.46 0.37		

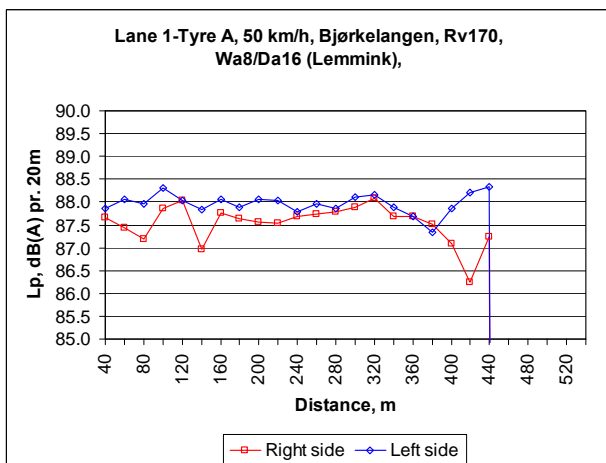
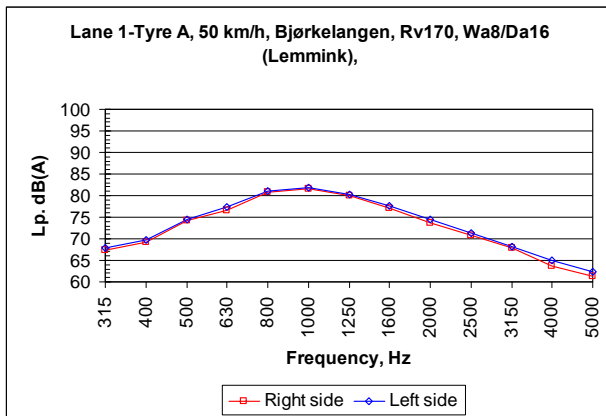


**Pavement 25: Wa8/Da16. Rv170 - Bjørkelangen, lane 1, 50 km/h**

2006:

Location	Bjørkelangen, Rv170
Road surface type	Wa8/Da16 (Lemmink)
Test section length	440
Direction	Lane 1
Date	10.10.2006
Air temperature	10
Road temperature	6

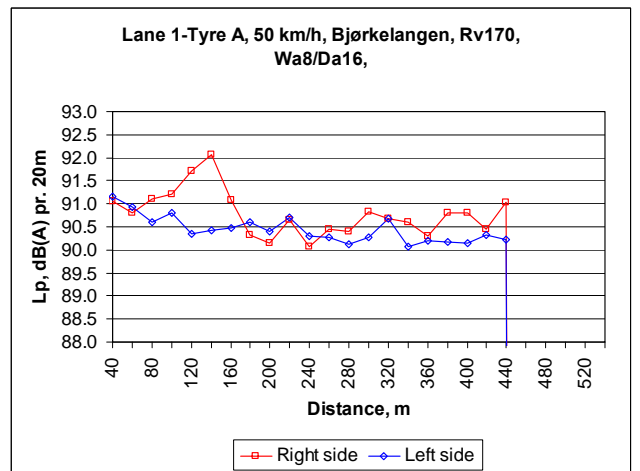
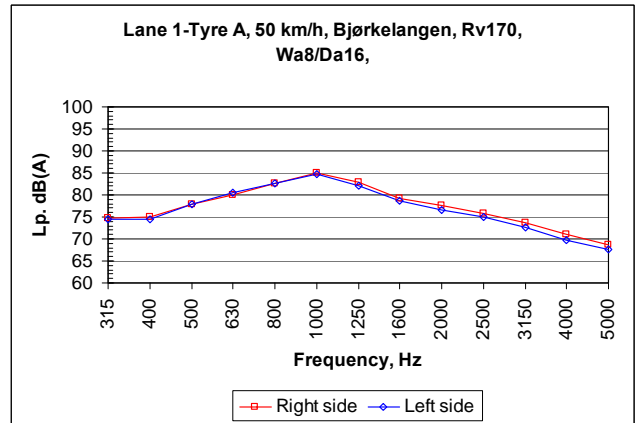
Lane 1-Tyre A, 50 km/h, Bjørkelangen, Rv170, Wa8/Da16 (Lemmink),				
Total-average speed for dist. 0 - 440 m		50.8 km/h		
Std.dev.		0.31		
dBA / Distance	Air temp	10	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 440 m	87.9	88.2	87.6	87.9
Average for dist. 40 - 460 m			87.5	88.0
Std.dev.			0.41	0.22



2007:

Location	Bjørkelangen, Rv170
Road surface type	Wa8/Da16
Test section length	440
Direction	Lane 1
Date	19.09.2007
Air temperature	11
Road temperature	14

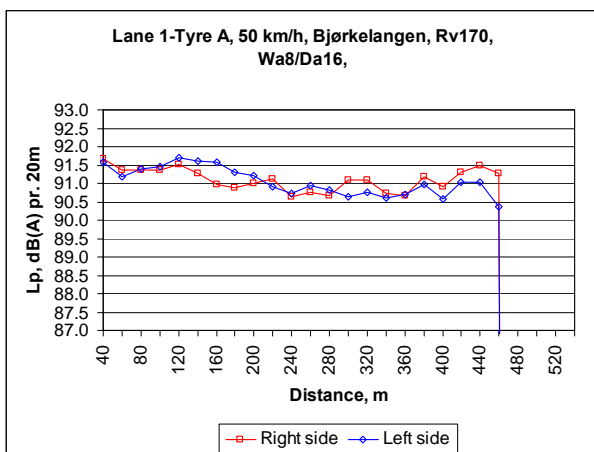
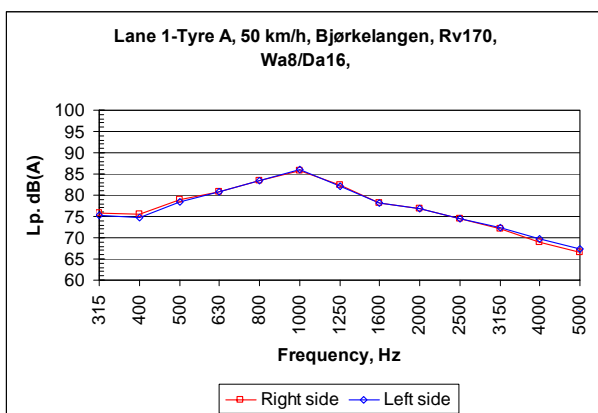
Lane 1-Tyre A, 50 km/h, Bjørkelangen, Rv170, Wa8/Da16,			
Total-average speed for dist. 0 - 440 m		49.8 km/h	
Std.dev.		0.30	
dBA / Distance	Air temp	11	Temp.corr. to +20C
	Right s	Left s	Right side
Total-average for dist. 0 - 440 m	91.1	90.8	90.8
Average for dist. 40 - 460 m			90.8
Std.dev.			0.49



**2008:**

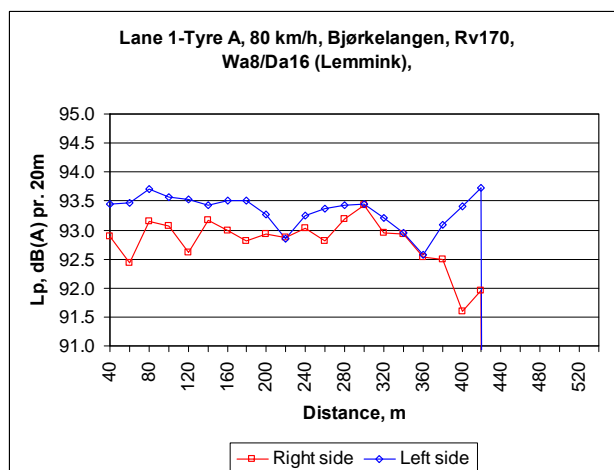
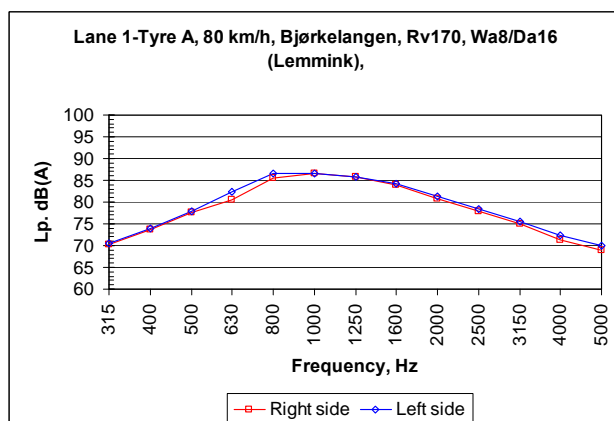
Location	Bjørkelangen, Rv170
Road surface type	Wa8/Da16
Test section length	460
Direction	Lane 1
Date	24.06.2008
Air temperature	25
Road temperature	29

Lane 1-Tyre A, 50 km/h, Bjørkelangen, Rv170, Wa8/Da16,				
Total-average speed for dist. 0 - 460 m		52.0 km/h		
Std.dev.		1.56		
dBA / Distance	Air temp	25	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 460 m				
	91.0	90.9	91.2	91.1
Average for dist. 40 - 480 m			91.1	91.0
Std.dev.			0.31	0.39


**Pavement 25: Wa8/Da16. Rv170 - Bjørkelangen, lane 1, 80 km/h**
**2006:**

Location	Bjørkelangen, Rv170
Road surface type	Wa8/Da16 (Lemmink)
Test section length	420
Direction	Lane 1
Date	10.10.2006
Air temperature	10
Road temperature	6

Lane 1-Tyre A, 80 km/h, Bjørkelangen, Rv170, Wa8/Da16 (Lemmink)				
Total-average speed for dist. 0 - 420 m		81.3 km/h		
Std.dev.		0.85		
dBA / Distance	Air temp	10	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 420 m				
	93.1	93.6	92.8	93.3
Average for dist. 40 - 440 m			92.8	93.3
Std.dev.			0.43	0.29

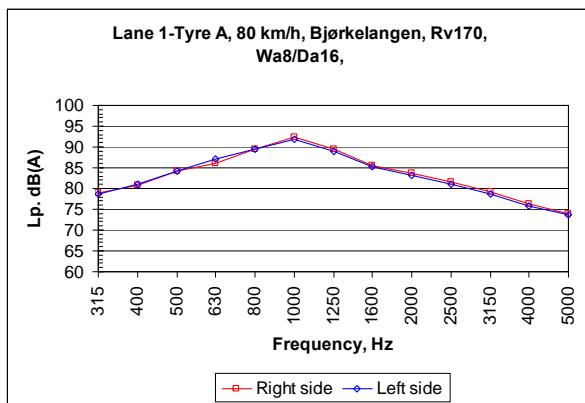




**2007:**

Location	Bjørkelangen, Rv170		
Road surface type	Wa8/Da16		
Test section length	440		
Direction	Lane 1		
Date	19.09.2007		
Air temperature			11
Road temperature			14

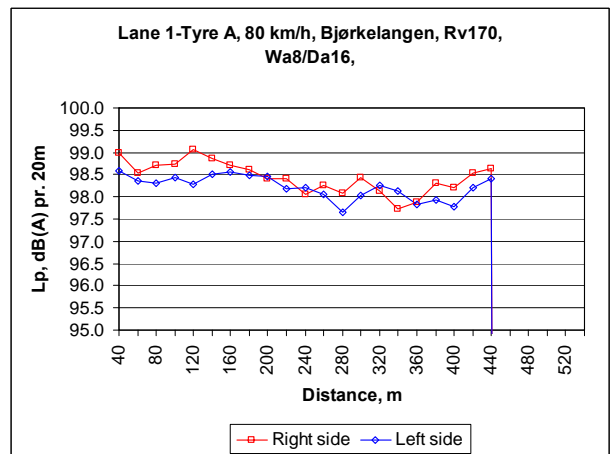
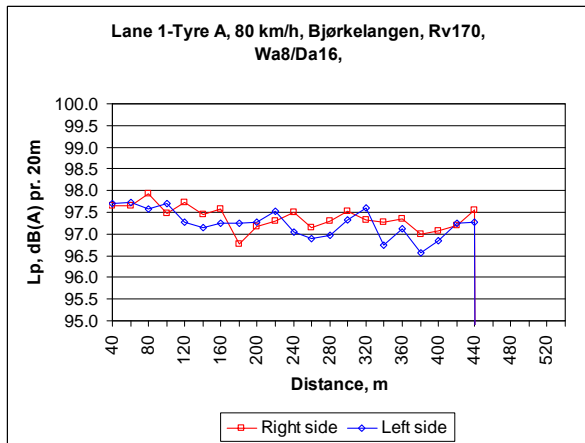
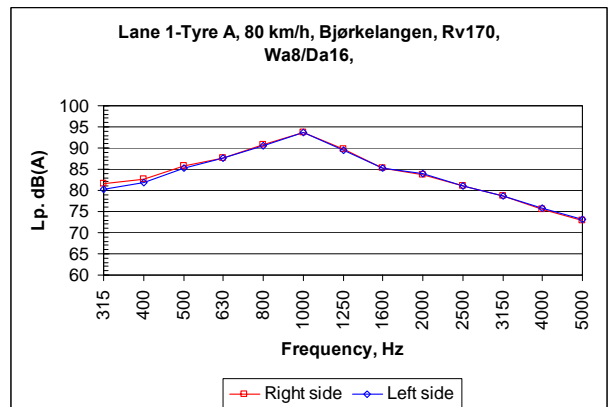
Lane 1-Tyre A, 80 km/h, Bjørkelangen, Rv170, Wa8/Da16,				
Total-average speed	for dist. 0 - 440 m		80.8	km/h
Std.dev.			0.87	
dBA / Distance	Air temp	11	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 440 m			
	97.7	97.6	97.4	97.3
Average	for dist. 40 - 460 m		97.4	97.2
Std.dev.			0.27	0.32



**2008:**

Location	Bjørkelangen, Rv170		
Road surface type	Wa8/Da16		
Test section length	460		
Direction	Lane 1		
Date	24.06.2008		
Air temperature			25
Road temperature			29

Lane 1-Tyre A, 80 km/h, Bjørkelangen, Rv170, Wa8/Da16,				
Total-average speed	for dist. 0 - 440 m		81.3	km/h
Std.dev.			0.96	
dBA / Distance	Air temp	25	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 440 m			
	98.3	98.1	98.5	98.2
Average	for dist. 40 - 460 m		98.4	98.2
Std.dev.			0.35	0.26

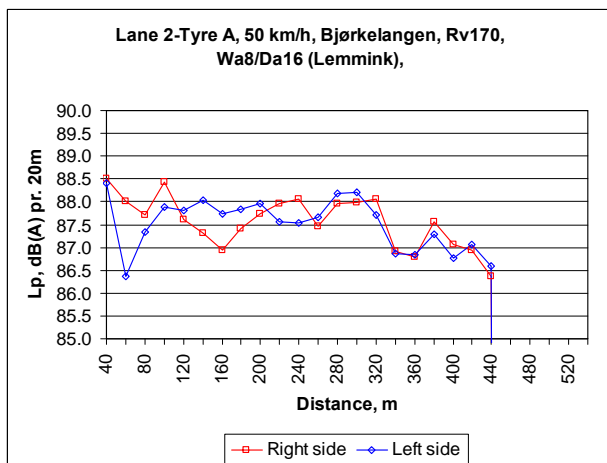
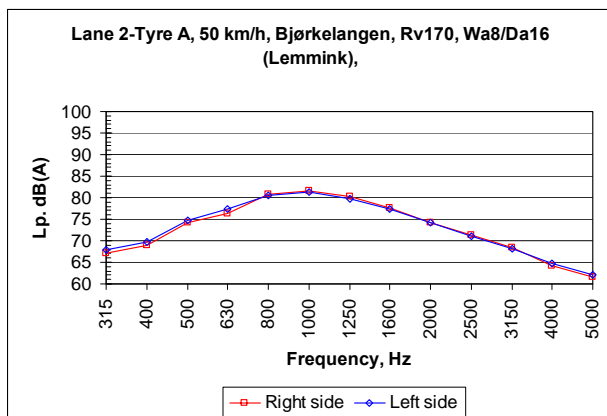


### Pavement 25: Wa8/Da16. Rv170 - Bjørkelangen, lane 2, 50 km/h

**2006:**

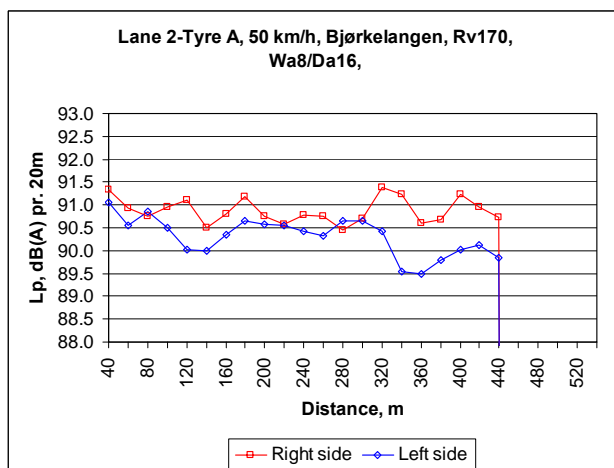
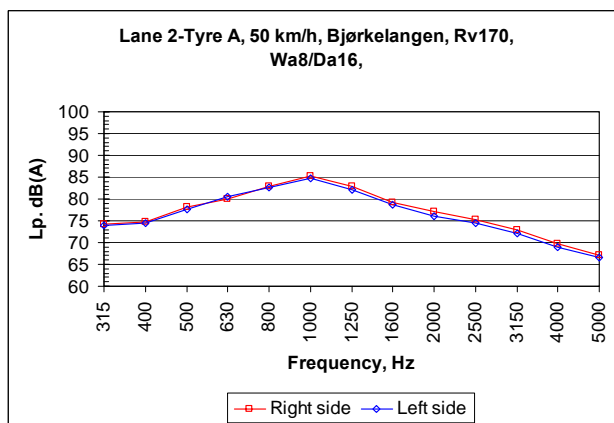
Location	Bjørkelangen, Rv170		
Road surface type	Wa8/Da16 (Lemmink)		
Test section length	440		
Direction	Lane 2		
Date	10.10.2006		
Air temperature			10
Road temperature			6

Lane 2-Tyre A, 50 km/h, Bjørkelangen, Rv170, Wa8/Da16 (Lemmink)				
Total-average speed for dist. 0 - 440 m		50.8 km/h		
Std.dev.		0.33		
dBA / Distance	Air temp	10	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 440 m				
	88.0	87.9	87.7	87.6
Average for dist. 40 - 460 m				
			87.6	87.5
Std.dev.				
			0.57	0.57


**2007:**

Location	Bjørkelangen, Rv170		
Road surface type	Wa8/Da16		
Test section length	440		
Direction	Lane 2		
Date	19.09.2007		
Air temperature			11
Road temperature			14

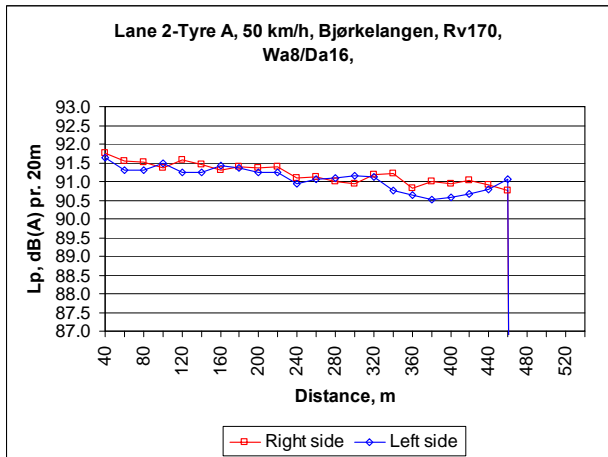
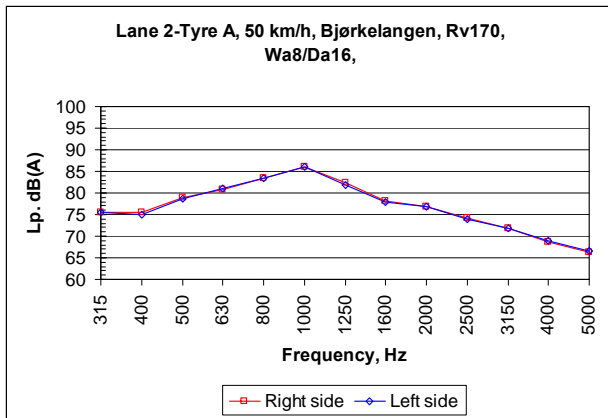
Lane 2-Tyre A, 50 km/h, Bjørkelangen, Rv170, Wa8/Da16,				
Total-average speed for dist. 0 - 440 m		49.8 km/h		
Std.dev.		0.33		
dBA / Distance	Air temp	11	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 440 m				
	91.2	90.7	90.9	90.4
Average for dist. 40 - 460 m				
			90.9	90.3
Std.dev.				
			0.28	0.42



2008:

Location	Bjørkelangen, Rv170
Road surface type	Wa8/Da16
Test section length	460
Direction	Lane 2
Date	24.06.2008
Air temperature	25
Road temperature	29

Lane 2-Tyre A, 50 km/h, Bjørkelangen, Rv170, Wa8/Da16,				
Total-average speed for dist. 0 - 460 m		51.3 km/h		
Std.dev.		1.39		
dBA / Distance	Air temp	25	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 460 m				
	91.1	91.0	91.2	91.1
Average for dist. 40 - 480 m			91.2	91.1
Std.dev.			0.27	0.31

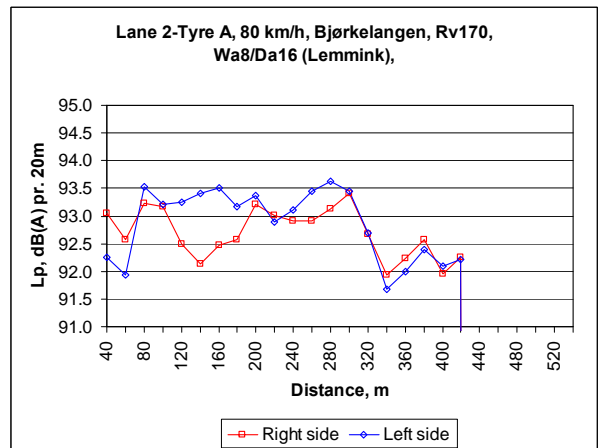
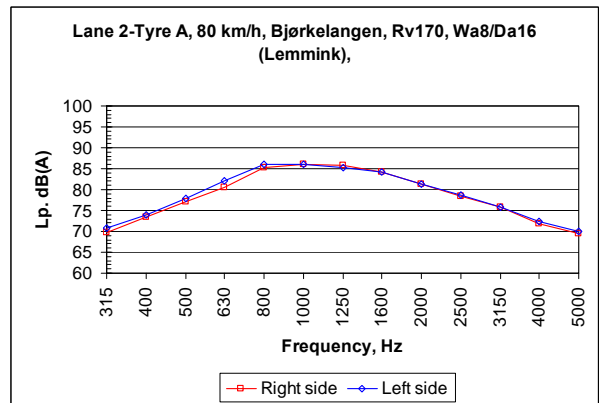


**Pavement 25: Wa8/Da16. Rv170 - Bjørkelangen, lane 2, 80 km/h**

2006:

Location	Bjørkelangen, Rv170
Road surface type	Wa8/Da16 (Lemmink)
Test section length	420
Direction	Lane 2
Date	10.10.2006
Air temperature	10
Road temperature	6

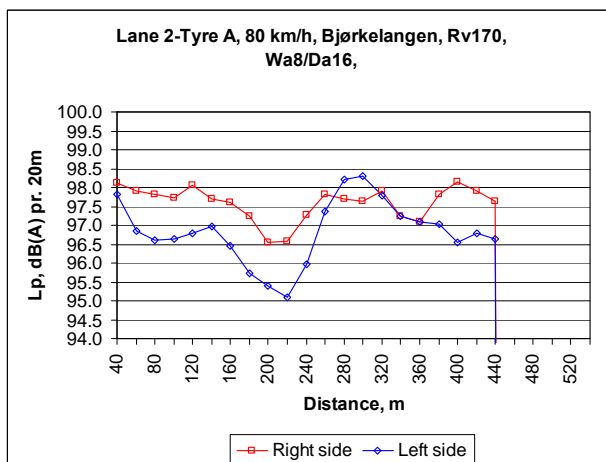
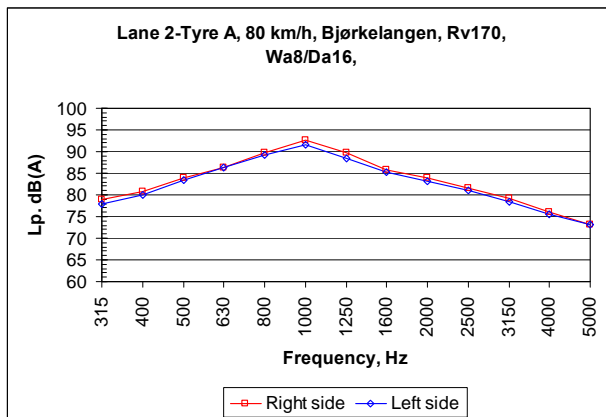
Lane 2-Tyre A, 80 km/h, Bjørkelangen, Rv170, Wa8/Da16 (Lemmink)				
Total-average speed for dist. 0 - 420 m		81.2 km/h		
Std.dev.		0.67		
dBA / Distance	Air temp	10	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 420 m				
	93.1	93.3	92.8	93.0
Average for dist. 40 - 440 m			92.7	92.9
Std.dev.			0.45	0.64



**2007:**

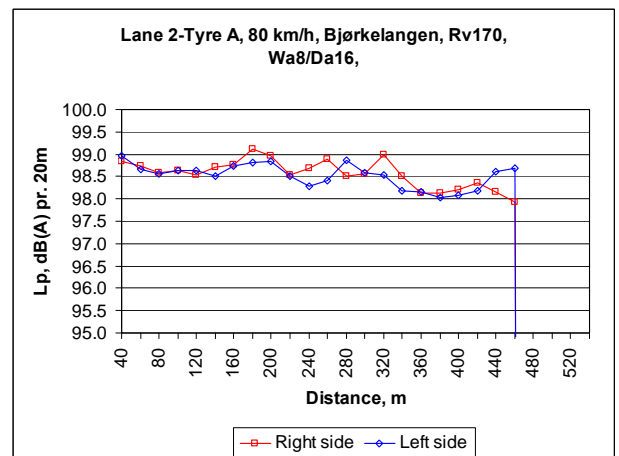
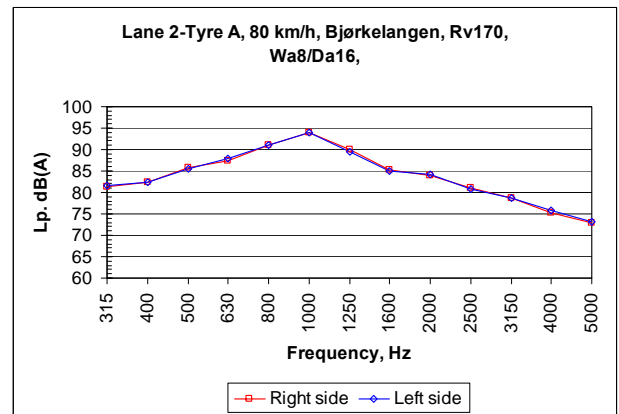
Location	Bjørkelangen, Rv170
Road surface type	Wa8/Da16
Test section length	440
Direction	Lane 2
Date	19.09.2007
Air temperature	11
Road temperature	14

Lane 2-Tyre A, 80 km/h, Bjørkelangen, Rv170, Wa8/Da16,			
Total-average speed for dist. 0 - 440 m		80.8 km/h	
Std.dev.		0.61	
dBA / Distance	Air temp	11	Temp.corr. to +20C
	Right s	Left s	Right side Left side
Total-average for dist. 0 - 440 m			
	97.9	97.2	97.7 96.9
Average for dist. 40 - 460 m			97.6 96.8
Std.dev.			0.45 0.84


**2008:**

Location	Bjørkelangen, Rv170
Road surface type	Wa8/Da16
Test section length	460
Direction	Lane 2
Date	24.06.2008
Air temperature	25
Road temperature	29

Lane 2-Tyre A, 80 km/h, Bjørkelangen, Rv170, Wa8/Da16,			
Total-average speed for dist. 0 - 460 m		82.2 km/h	
Std.dev.		0.96	
dBA / Distance	Air temp	25	Temp.corr. to +20C
	Right s	Left s	Right side Left side
Total-average for dist. 0 - 460 m			
	98.5	98.4	98.6 98.6
Average for dist. 40 - 480 m			98.6 98.5
Std.dev.			0.31 0.27

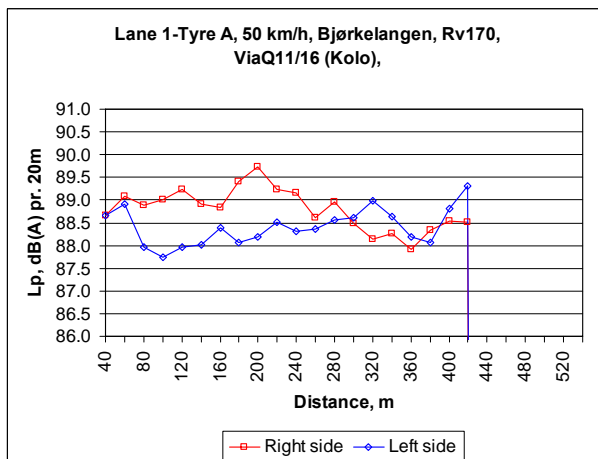
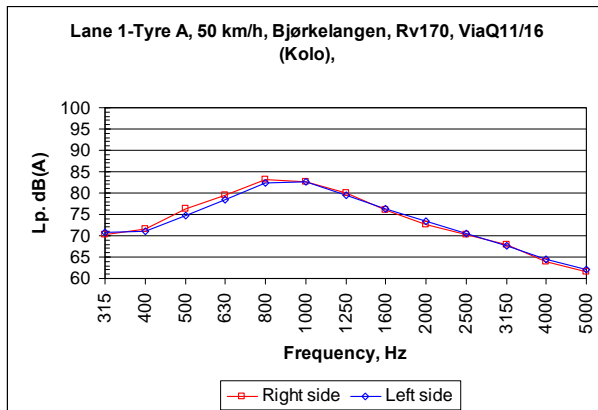


**Pavement 26: ViaQ11/ViaQ16. Rv170  
- Bjørkelangen, lane 1, 50 km/h**

**2006:**

Location	Bjørkelangen, Rv170
Road surface type	ViaQ11/16 (Kolo)
Test section length	420
Direction	Lane 1
Date	10.10.2006
Air temperature	10
Road temperature	6

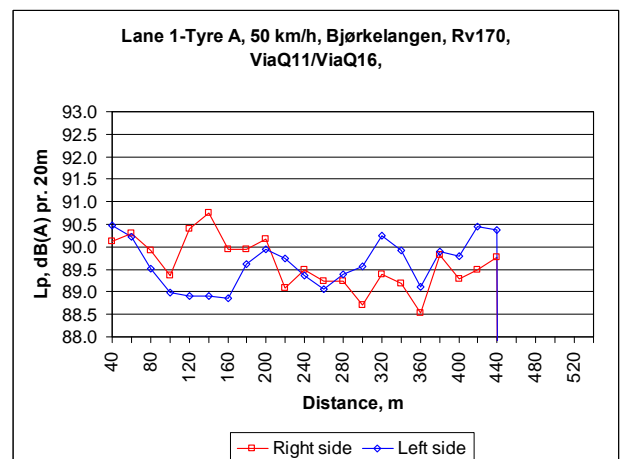
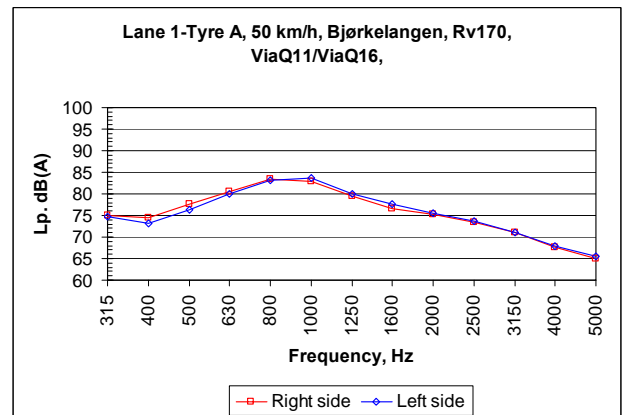
Lane 1-Tyre A, 50 km/h, Bjørkelangen, Rv170, ViaQ11/16 (Kolo),				
Total-average speed for dist. 0 - 420 m		50.8		km/h
Std.dev.		0.59		
dBA / Distance	Air temp	10	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 420 m		89.1		88.7
Average for dist. 40 - 440 m		88.8		88.4
Std.dev.		0.46		0.40



**2007:**

Location	Bjørkelangen, Rv170
Road surface type	ViaQ11/ViaQ16
Test section length	440
Direction	Lane 1
Date	19.09.2007
Air temperature	11
Road temperature	14

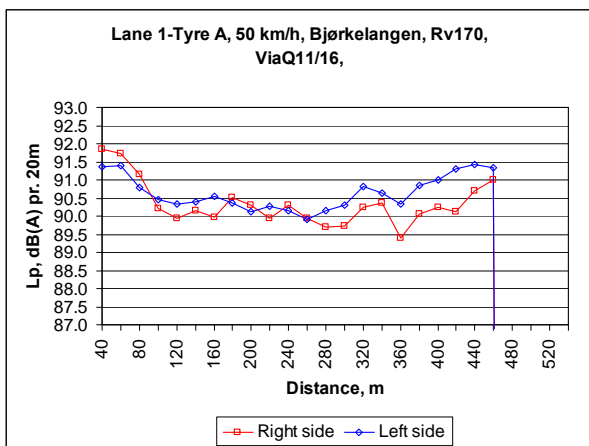
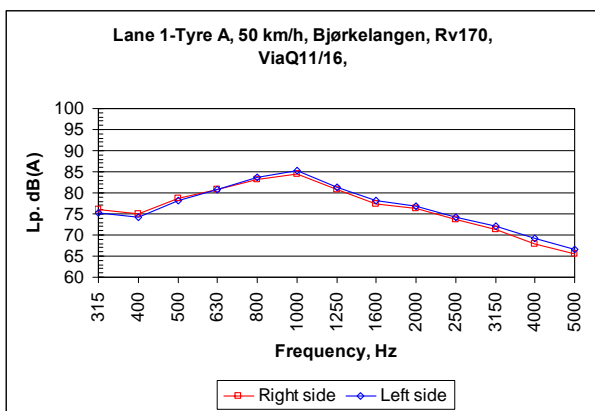
Lane 1-Tyre A, 50 km/h, Bjørkelangen, Rv170, ViaQ11/ViaQ16,				
Total-average speed for dist. 0 - 440 m		49.8		km/h
Std.dev.		0.61		
dBA / Distance	Air temp	11	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 440 m		89.9		90.0
Average for dist. 40 - 460 m		89.6		89.6
Std.dev.		0.56		0.54



2008:

Location	Bjørkelangen, Rv170
Road surface type	ViaQ11/16
Test section length	460
Direction	Lane 1
Date	24.06.2008
Air temperature	25
Road temperature	29

Lane 1-Tyre A, 50 km/h, Bjørkelangen, Rv170, ViaQ11/16,				
Total-average speed for dist. 0 - 460 m		52.1 km/h		
Std.dev.		1.87		
dBA / Distance	Air temp	25	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 460 m				
	90.3	90.6	90.5	90.7
Average for dist. 40 - 480 m				
	Std.dev.		0.62	0.47

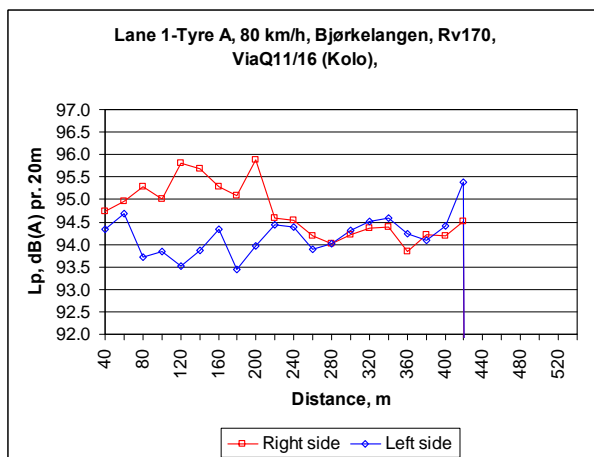
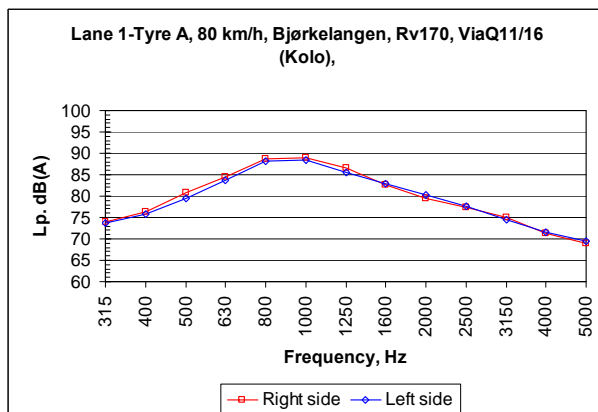


**Pavement 26: ViaQ11/ViaQ16. Rv170 - Bjørkelangen, lane 1, 80 km/h**

2006:

Location	Bjørkelangen, Rv170
Road surface type	ViaQ11/16 (Kolo)
Test section length	420
Direction	Lane 1
Date	1010.2006
Air temperature	10
Road temperature	6

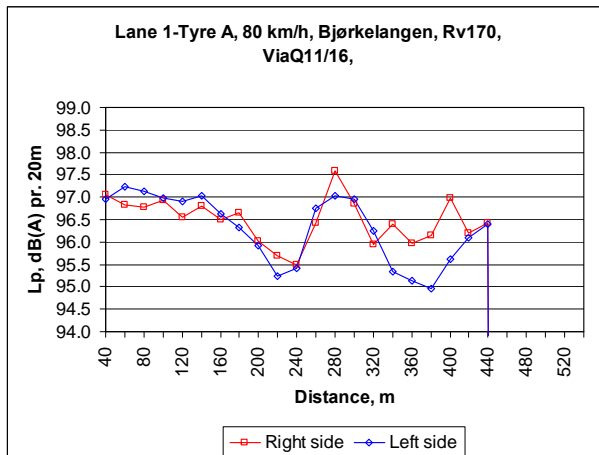
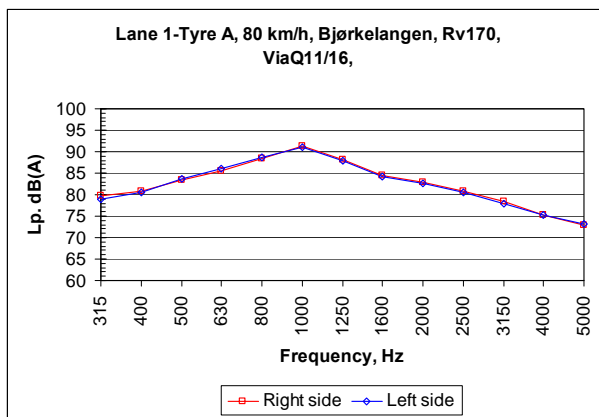
Lane 1-Tyre A, 80 km/h, Bjørkelangen, Rv170, ViaQ11/16 (Kolo),				
Total-average speed for dist. 0 - 420 m		80.8 km/h		
Std.dev.		0.93		
dBA / Distance	Air temp	10	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 420 m				
	95.0	94.5	94.7	94.2
Average for dist. 40 - 440 m				
	Std.dev.		0.61	0.45



**2007:**

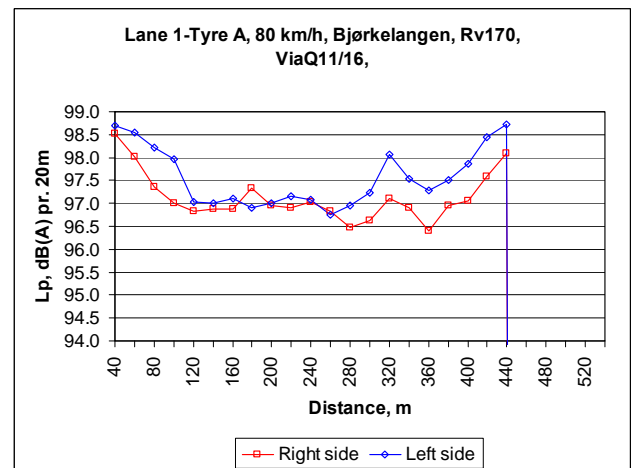
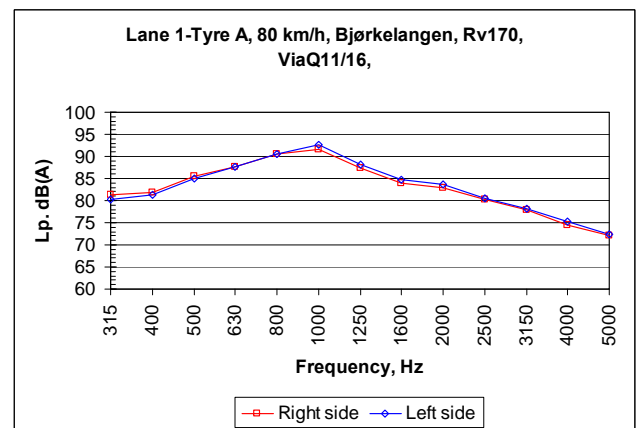
Location	Bjørkelangen, Rv170	
Road surface type	ViaQ11/16	
Test section length	500	
Direction	Lane 1	
Date	19.09.2007	
Air temperature		11
Road temperature		14

Lane 1-Tyre A, 80 km/h, Bjørkelangen, Rv170, ViaQ11/16,				
Total-average speed for dist. 0 - 520 m		80.7 km/h		
Std.dev.		0.62		
dBA / Distance	Air temp Right s	11 Left s	Temp.corr. to +20C Right side Left side	
Total-average for dist. 0 - 520 m				
	96.8	96.8	96.6	96.5
Average for dist. 40 - 460 m				
			96.5	96.3
Std.dev.				
			0.50	0.75


**2008:**

Location	Bjørkelangen, Rv170	
Road surface type	ViaQ11/16	
Test section length	440	
Direction	Lane 1	
Date	24.06.2008	
Air temperature		25
Road temperature		29

Lane 1-Tyre A, 80 km/h, Bjørkelangen, Rv170, ViaQ11/16,				
Total-average speed for dist. 0 - 440 m		81.4 km/h		
Std.dev.		1.44		
dBA / Distance	Air temp Right s	25 Left s	Temp.corr. to +20C Right side Left side	
Total-average for dist. 0 - 440 m				
	97.1	97.6	97.3	97.7
Average for dist. 40 - 460 m				
			97.1	97.6
Std.dev.				
			0.53	0.65

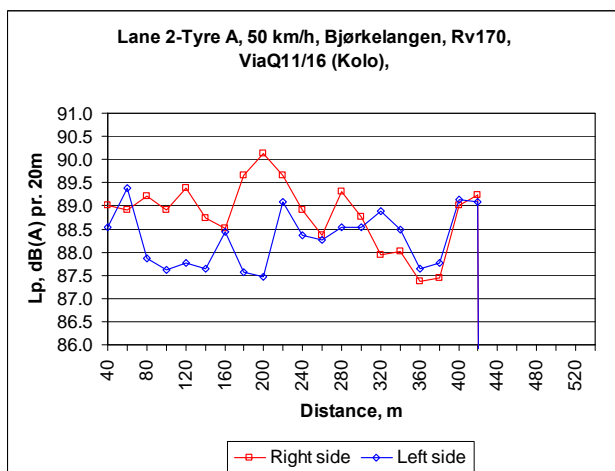
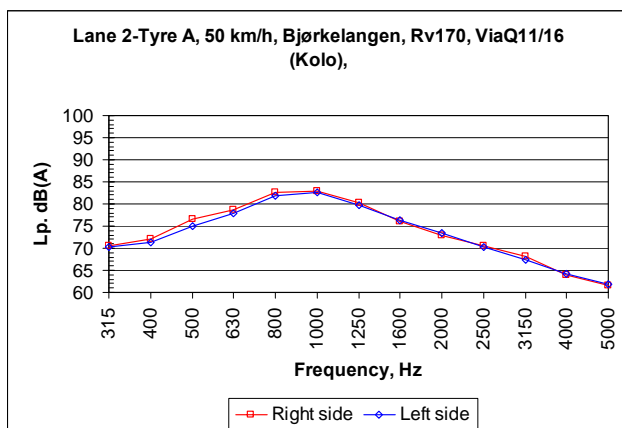


**Pavement 26: ViaQ11/ViaQ16. Rv170  
- Bjørkelangen, lane 2, 50 km/h**

**2006:**

Location	Bjørkelangen, Rv170		
Road surface type	ViaQ11/16 (Kolo)		
Test section length	420		
Direction	Lane 2		
Date	10.10.2006		
Air temperature			10
Road temperature			6

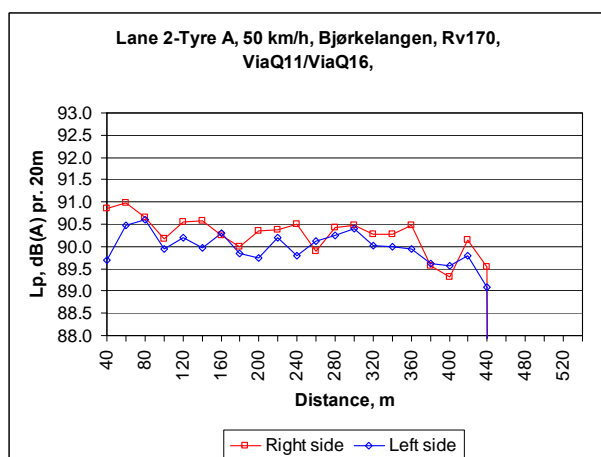
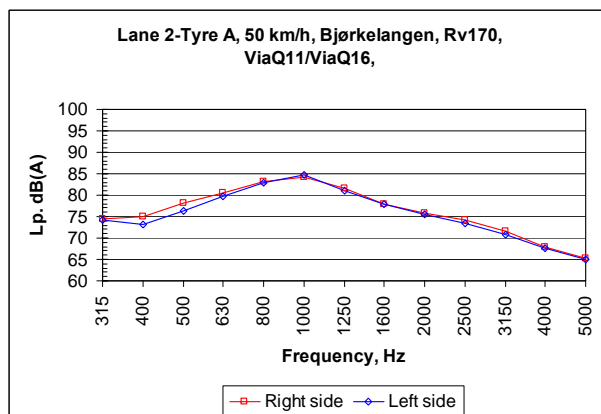
Lane 2-Tyre A, 50 km/h, Bjørkelangen, Rv170, ViaQ11/16 (Kolo),			
Total-average speed for dist. 0 - 420 m		50.7 km/h	
Std.dev.		0.42	
dBA / Distance	Air temp	10	Temp.corr. to +20C
	Right s	Left s	Right side Left side
Total-average for dist. 0 - 420 m			
	89.1	88.6	88.8 88.3
Average for dist. 40 - 440 m			88.8 88.3
Std.dev.			0.72 0.61



**2007:**

Location	Bjørkelangen, Rv170		
Road surface type	ViaQ11/ViaQ16		
Test section length	440		
Direction	Lane 2		
Date	19.09.2007		
Air temperature			11
Road temperature			14

Lane 2-Tyre A, 50 km/h, Bjørkelangen, Rv170, ViaQ11/ViaQ16,			
Total-average speed for dist. 0 - 440 m		49.7 km/h	
Std.dev.		0.40	
dBA / Distance	Air temp	11	Temp.corr. to +20C
	Right s	Left s	Right side Left side
Total-average for dist. 0 - 440 m			
	90.6	90.3	90.3 90.0
Average for dist. 40 - 460 m			90.3 90.0
Std.dev.			0.42 0.35

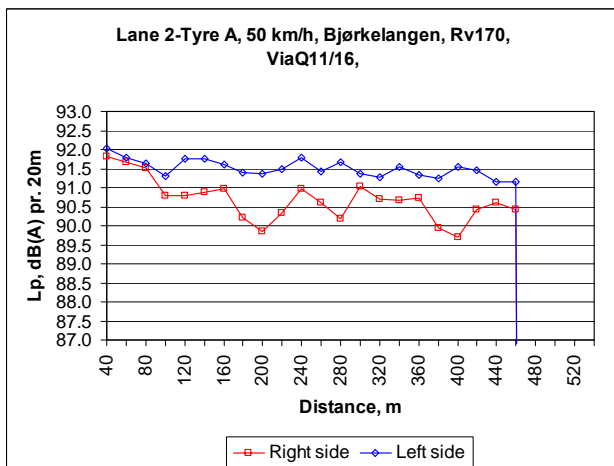
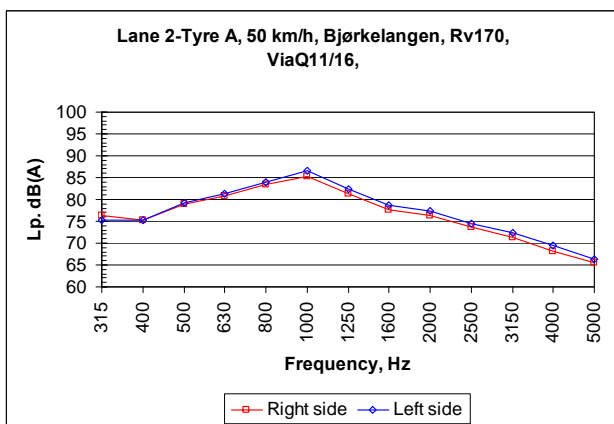




2008:

Location	Bjørkelangen, Rv170
Road surface type	ViaQ11/16
Test section length	460
Direction	Lane 2
Date	24.06.2008
Air temperature	25
Road temperature	29

Lane 2-Tyre A, 50 km/h, Bjørkelangen, Rv170, ViaQ11/16,				
Total-average speed for dist. 0 - 460 m		50.2 km/h		
Std.dev.		1.17		
dBA / Distance	Air temp	25	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 460 m			90.8	91.5
	90.6	91.4		
Average for dist. 40 - 480 m			90.7	91.5
	Std.dev.		0.55	0.23

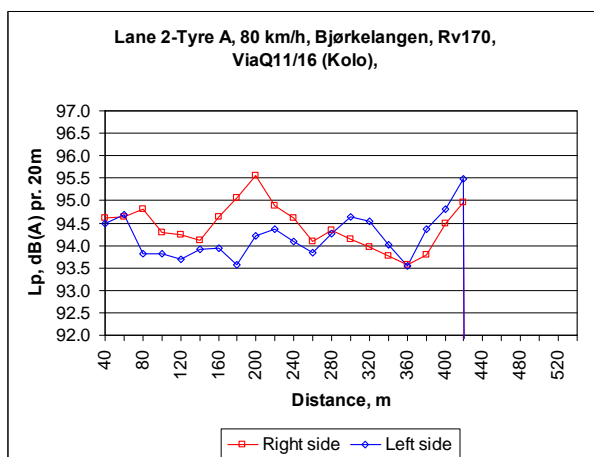
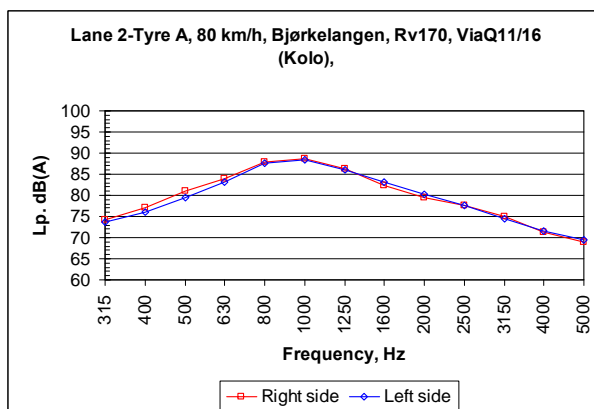


Pavement 26: ViaQ11/ViaQ16. Rv170 - Bjørkelangen, lane 2, 80 km/h

2006:

Location	Bjørkelangen, Rv170
Road surface type	ViaQ11/16 (Kolo)
Test section length	420
Direction	Lane 2
Date	1010.2006
Air temperature	10
Road temperature	6

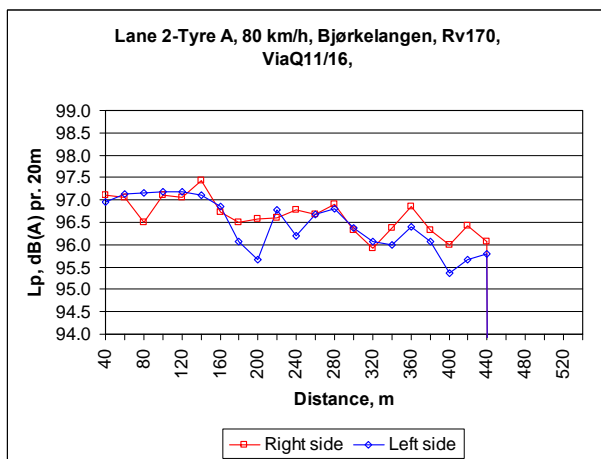
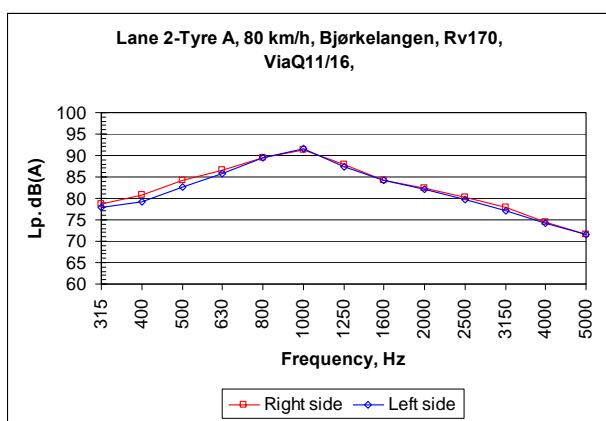
Lane 2-Tyre A, 80 km/h, Bjørkelangen, Rv170, ViaQ11/16 (Kolo),				
Total-average speed for dist. 0 - 420 m		80.5 km/h		
Std.dev.		1.04		
dBA / Distance	Air temp	10	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 420 m			94.5	94.2
	94.8	94.5		
Average for dist. 40 - 440 m			94.4	94.2
	Std.dev.		0.49	0.48



**2007:**

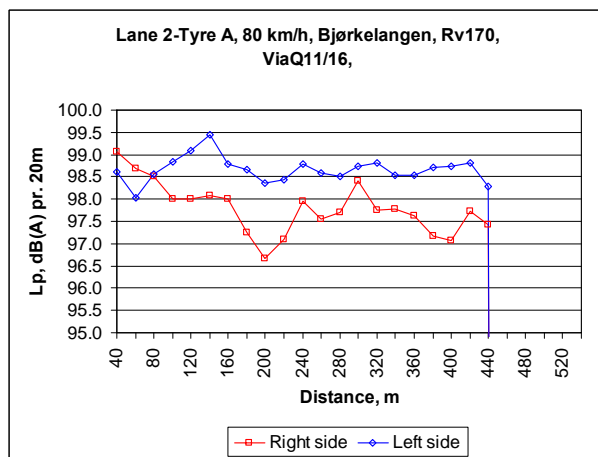
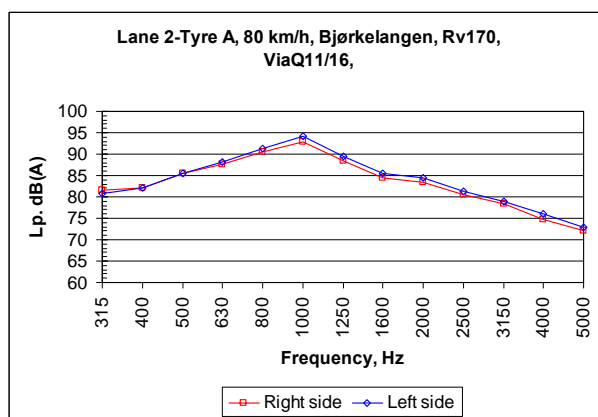
Location	Bjørkelangen, Rv170
Road surface type	ViaQ11/16
Test section length	440
Direction	Lane 2
Date	19.09.2007
Air temperature	11
Road temperature	14

Lane 2-Tyre A, 80 km/h, Bjørkelangen, Rv170, ViaQ11/16,				
Total-average speed for dist. 0 - 440 m		80.1 km/h		
Std.dev.		0.89		
dBA / Distance	Air temp	11	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 440 m				
		97.0	96.8	
Average for dist. 40 - 460 m		96.6		
Std.dev.		0.40		
		96.5	96.5	


**2008:**

Location	Bjørkelangen, Rv170
Road surface type	ViaQ11/16
Test section length	440
Direction	Lane 2
Date	24.06.2008
Air temperature	25
Road temperature	29

Lane 2-Tyre A, 80 km/h, Bjørkelangen, Rv170, ViaQ11/16,				
Total-average speed for dist. 0 - 440 m		81.1 km/h		
Std.dev.		1.32		
dBA / Distance	Air temp	25	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 440 m				
		97.8	98.5	
Average for dist. 40 - 460 m		97.8		
Std.dev.		0.58		
		98.7	98.7	

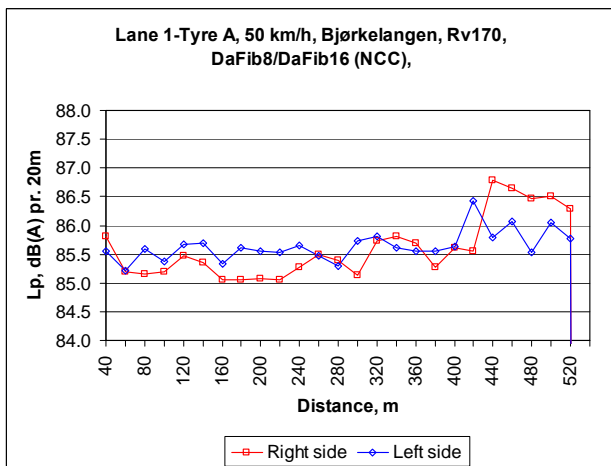
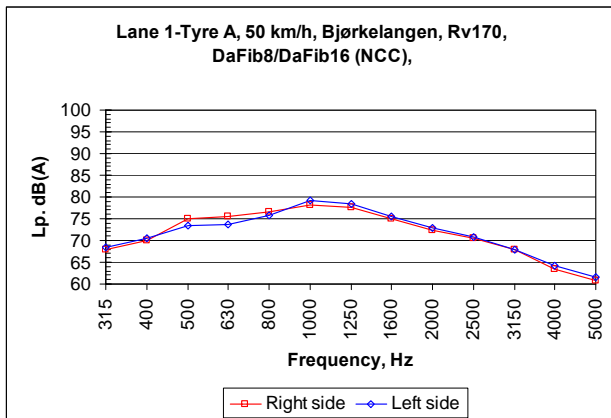


**Pavement 27: DaFib8/DaFib16.  
Rv170 - Bjørkelangen, lane 1,  
50 km/h**

**2006:**

Location	Bjørkelangen, Rv170	
Road surface type	DaFib8/DaFib16 (NCC)	
Test section length	520	
Direction	Lane 1	
Date	10.10.2006	
Air temperature		10
Road temperature		8

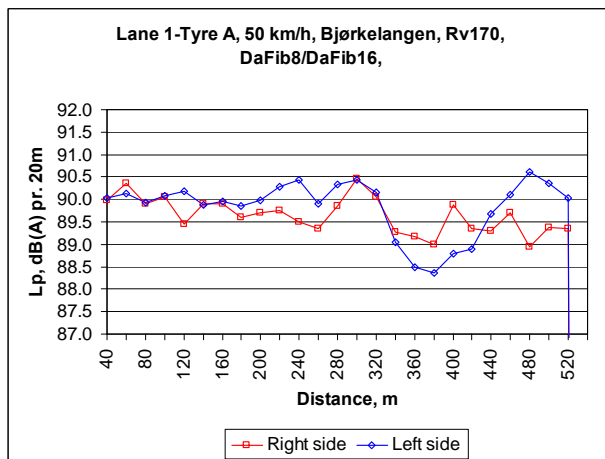
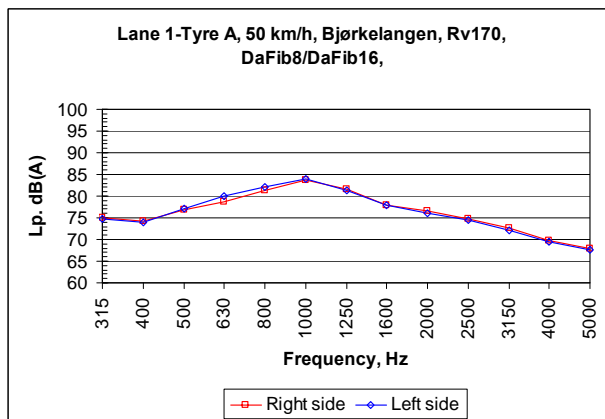
Lane 1-Tyre A, 50 km/h, Bjørkelangen, Rv170, DaFib8/DaFib16 (NCC),				
Total-average speed for dist. 0 - 520 m		50.8 km/h		
Std.dev.		0.25		
dBA / Distance	Air temp	10	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 520 m				
	85.8	85.9	85.5	85.6
Average for dist. 40 - 540 m				
Average			85.6	85.6
Std.dev.			0.54	0.26



**2007:**

Location	Bjørkelangen, Rv170	
Road surface type	DaFib8/DaFib16	
Test section length	520	
Direction	Lane 1	
Date	19.09.2007	
Air temperature		11
Road temperature		14

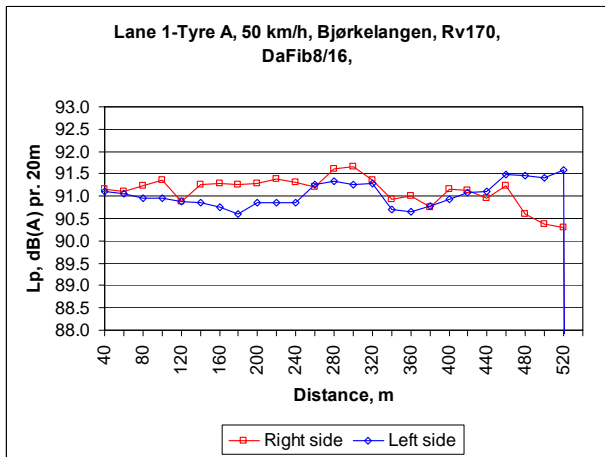
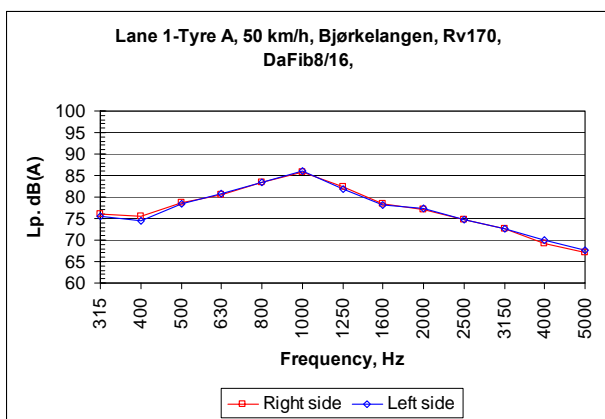
Lane 1-Tyre A, 50 km/h, Bjørkelangen, Rv170, DaFib8/DaFib16,				
Total-average speed for dist. 0 - 520 m		49.8 km/h		
Std.dev.		0.20		
dBA / Distance	Air temp	11	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 520 m				
	89.9	90.1	89.7	89.8
Average for dist. 40 - 540 m				
Average			89.6	89.8
Std.dev.			0.40	0.62



2008:

Location	Bjørkelangen, Rv170
Road surface type	DaFib8/16
Test section length	520
Direction	Lane 1
Date	24.06.2008
Air temperature	25
Road temperature	29

Lane 1-Tyre A, 50 km/h, Bjørkelangen, Rv170, DaFib8/16,				
Total-average speed for dist. 0 - 520 m		52.1 km/h		
Std.dev.		1.29		
dBA / Distance	Air temp	25	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 520 m				
	90.9	90.9	91.1	91.1
Average for dist. 40 - 540 m				
			91.1	91.0
Std.dev.				
			0.33	0.28

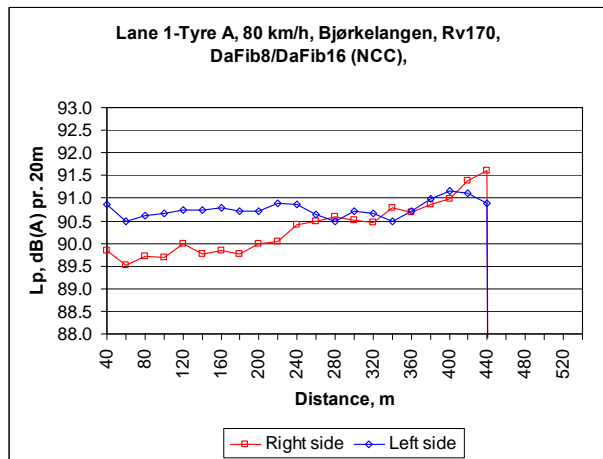
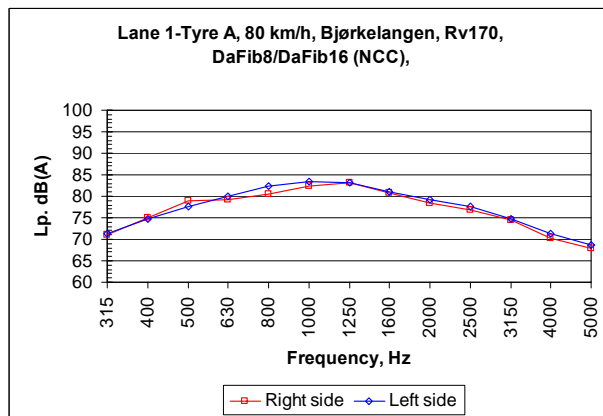


**Pavement 27: DaFib8/DaFib16.**  
**Rv170 - Bjørkelangen, lane 1,**  
**80 km/h**

2006:

Location	Bjørkelangen, Rv170
Road surface type	DaFib8/DaFib16 (NCC)
Test section length	440
Direction	Lane 1
Date	10.10.2006
Air temperature	10
Road temperature	8

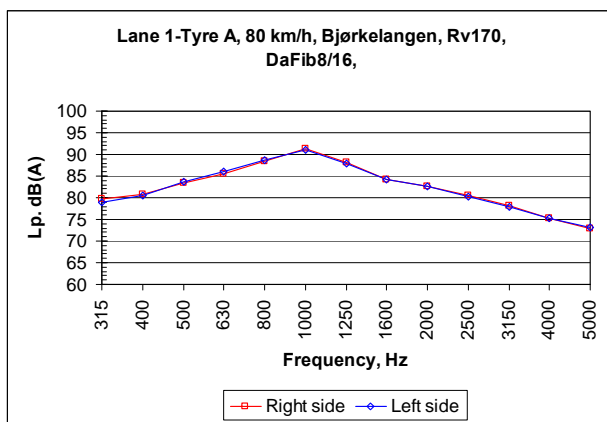
Lane 1-Tyre A, 80 km/h, Bjørkelangen, Rv170, DaFib8/DaFib16 (NCC),				
Total-average speed for dist. 0 - 440 m		81.3 km/h		
Std.dev.		0.46		
dBA / Distance	Air temp	10	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 440 m				
	90.6	91.1	90.3	90.8
Average for dist. 40 - 460 m				
			90.3	90.8
Std.dev.				
			0.58	0.18



2007:

Location	Bjørkelangen, Rv170		
Road surface type	DaFib8/16		
Test section length	520		
Direction	Lane 1		
Date	19.09.2007		
Air temperature			11
Road temperature			14

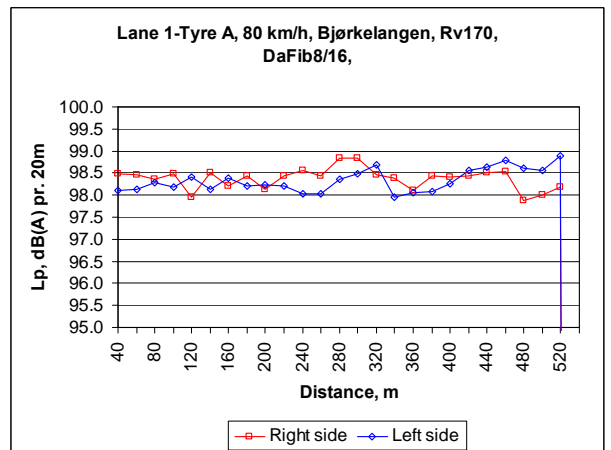
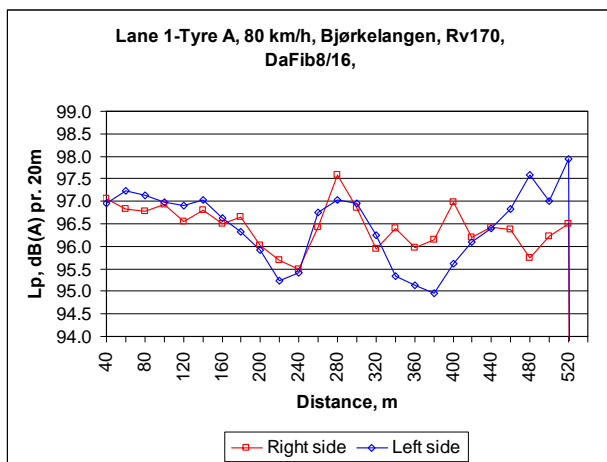
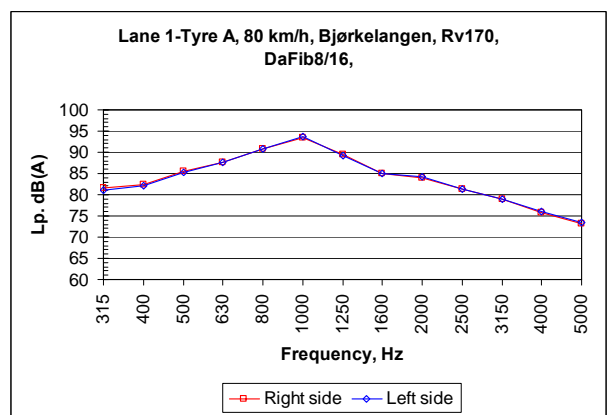
Lane 1-Tyre A, 80 km/h, Bjørkelangen, Rv170, DaFib8/16,				
Total-average speed for dist. 0 - 520 m		80.7 km/h		
Std.dev.		0.62		
dBA / Distance	Air temp Right s	11 Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 520 m		96.7	96.7	
Average for dist. 40 - 540 m			96.4	96.5
Std.dev.			0.49	0.81



2008:

Location	Bjørkelangen, Rv170		
Road surface type	DaFib8/16		
Test section length	520		
Direction	Lane 1		
Date	24.06.2008		
Air temperature			25
Road temperature			29

Lane 1-Tyre A, 80 km/h, Bjørkelangen, Rv170, DaFib8/16,				
Total-average speed for dist. 0 - 520 m		81.1 km/h		
Std.dev.		1.11		
dBA / Distance	Air temp Right s	25 Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 520 m		98.2	98.2	
Average for dist. 40 - 540 m			98.4	98.3
Std.dev.			0.24	0.26

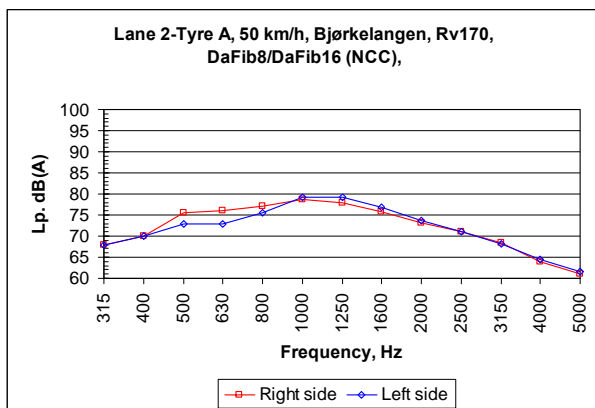


**Pavement 27: DaFib8/DaFib16.  
Rv170 - Bjørkelangen, lane 2,  
50 km/h**

**2006:**

Location	Bjørkelangen, Rv170
Road surface type	DaFib8/DaFib16 (NCC)
Test section length	440
Direction	Lane 2
Date	10.10.2006
Air temperature	10
Road temperature	8

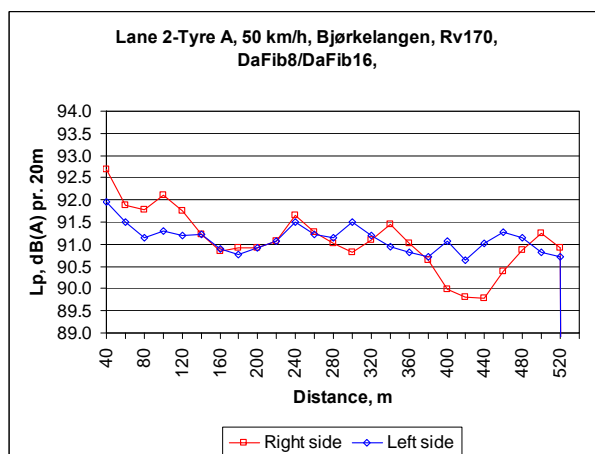
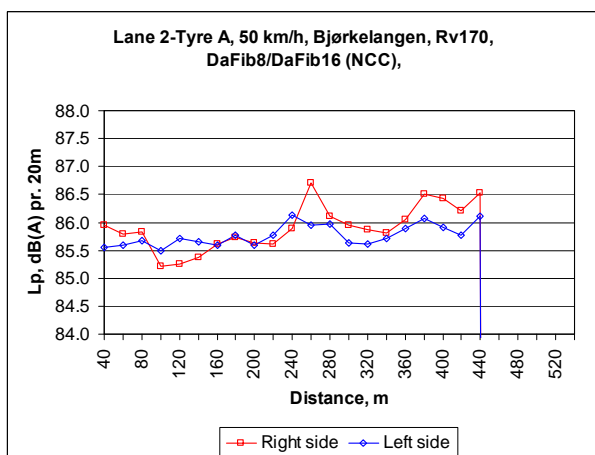
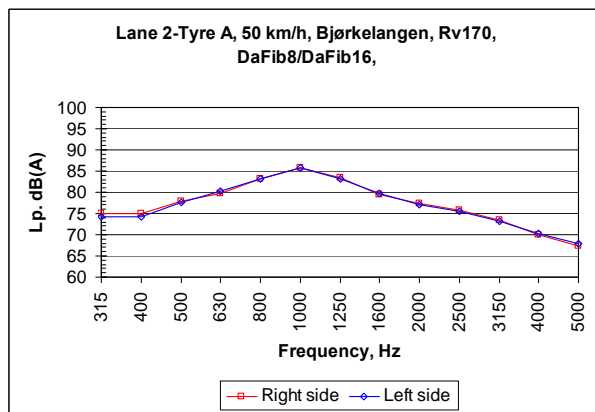
Lane 2-Tyre A, 50 km/h, Bjørkelangen, Rv170, DaFib8/DaFib16 (NCC),				
Total-average speed for dist. 0 - 440 m		51.1 km/h		
Std.dev.		0.59		
dBA / Distance	Air temp	10	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 440 m				
		85.9 85.7		
Average for dist. 40 - 460 m		85.9 85.8		
Std.dev.		0.41 0.19		



**2007:**

Location	Bjørkelangen, Rv170
Road surface type	DaFib8/DaFib16
Test section length	520
Direction	Lane 2
Date	19.09.2007
Air temperature	11
Road temperature	14

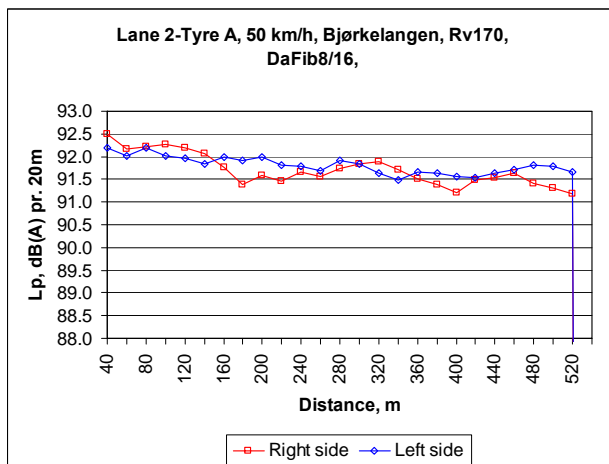
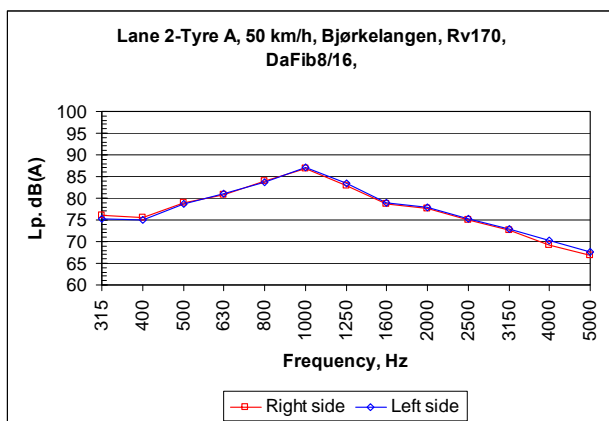
Lane 2-Tyre A, 50 km/h, Bjørkelangen, Rv170, DaFib8/DaFib16,				
Total-average speed for dist. 0 - 520 m		49.8 km/h		
Std.dev.		0.26		
dBA / Distance	Air temp	11	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 520 m				
		91.5 91.5 91.3 91.2		
Average for dist. 40 - 540 m		91.1 91.1		
Std.dev.		0.69 0.31		



2008:

Location	Bjørkelangen, Rv170
Road surface type	DaFib8/16
Test section length	520
Direction	Lane 2
Date	24.06.2008
Air temperature	25
Road temperature	29

Lane 2-Tyre A, 50 km/h, Bjørkelangen, Rv170, DaFib8/16,				
Total-average speed for dist. 0 - 520 m		51.4 km/h		
Std.dev.		0.90		
dBA / Distance	Air temp	Right s	Left s	Temp.corr. to +20C
	25			Right side
				Left side
Total-average for dist. 0 - 520 m				
		91.6	91.7	91.8
				91.8
Average for dist. 40 - 540 m				
				91.7
				91.8
Std.dev.				
		0.35	0.19	

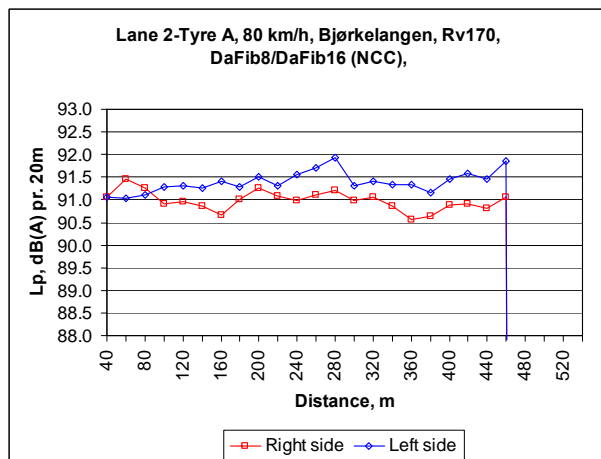
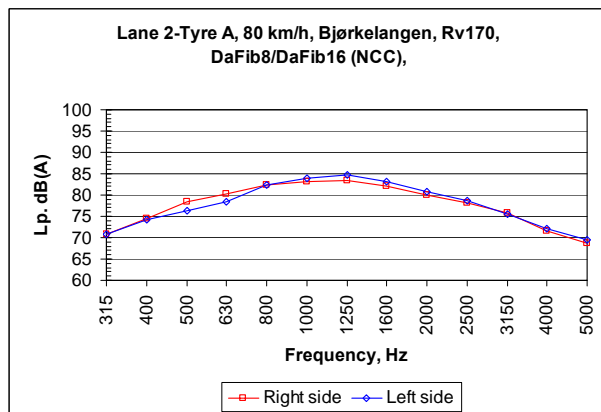


**Pavement 27: DaFib8/DaFib16.**  
**Rv170 - Bjørkelangen, lane 2,**  
**80 km/h**

2006:

Location	Bjørkelangen, Rv170
Road surface type	DaFib8/DaFib16 (NCC)
Test section length	460
Direction	Lane 2
Date	10.10.2006
Air temperature	10
Road temperature	8

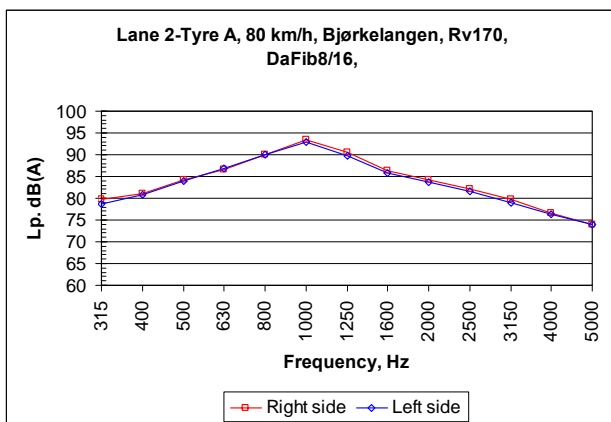
Lane 2-Tyre A, 80 km/h, Bjørkelangen, Rv170, DaFib8/DaFib16 (NCC)				
Total-average speed for dist. 0 - 460 m		81.3 km/h		
Std.dev.		0.36		
dBA / Distance	Air temp	Right s	Left s	Temp.corr. to +20C
	10			Right side
				Left side
<k for dist. 0 - 460 m				
		91.3	91.7	91.0
				91.4
Average for dist. 40 - 480 m				
				91.0
				91.4
Std.dev.				
		0.21	0.23	



**2007:**

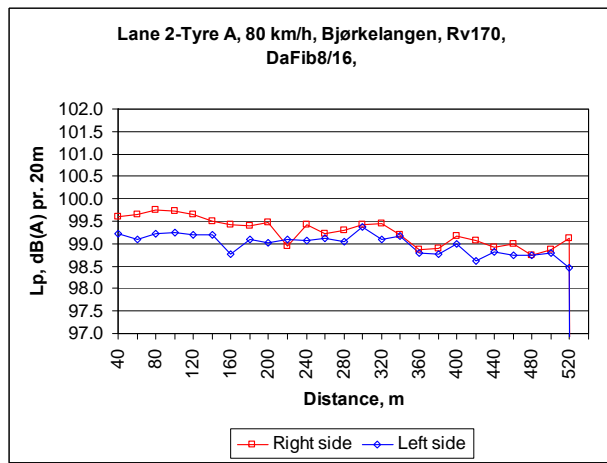
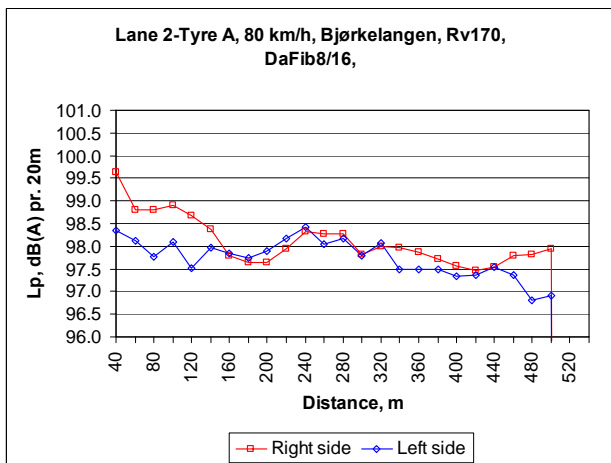
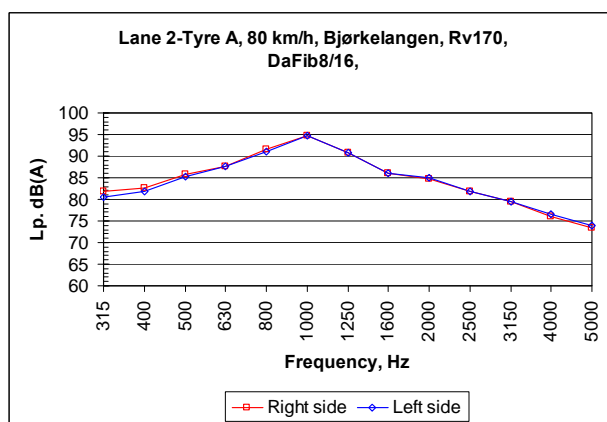
Location	Bjørkelangen, Rv170	
Road surface type	DaFib8/16	
Test section length	500	
Direction	Lane 2	
Date	19.09.2007	
Air temperature		11
Road temperature		14

Lane 2-Tyre A, 80 km/h, Bjørkelangen, Rv170, DaFib8/16,				
Total-average speed for dist. 0 - 500 m		80.8		km/h
Std.dev.		0.40		
dBA / Distance	Air temp	11	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 500 m		98.6		98.2
Average for dist. 40 - 520 m		98.1		97.7
Std.dev.		0.53		0.42


**2008:**

Location	Bjørkelangen, Rv170	
Road surface type	DaFib8/16	
Test section length	520	
Direction	Lane 2	
Date	24.06.2008	
Air temperature		25
Road temperature		29

Lane 2-Tyre A, 80 km/h, Bjørkelangen, Rv170, DaFib8/16,				
Total-average speed for dist. 0 - 520 m		82.0		km/h
Std.dev.		0.85		
dBA / Distance	Air temp	25	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 520 m		99.2		98.9
Average for dist. 40 - 540 m		99.3		99.0
Std.dev.		0.30		0.23



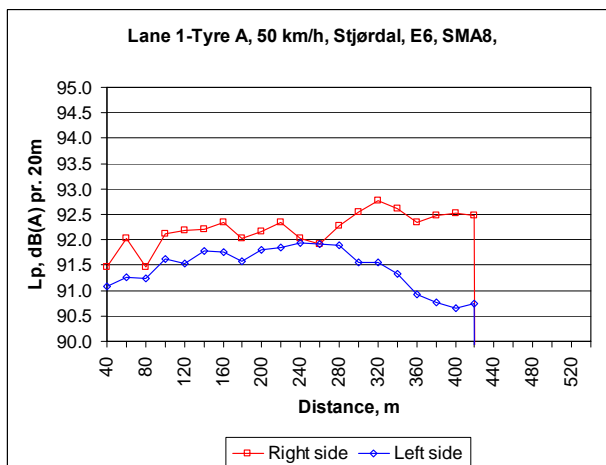
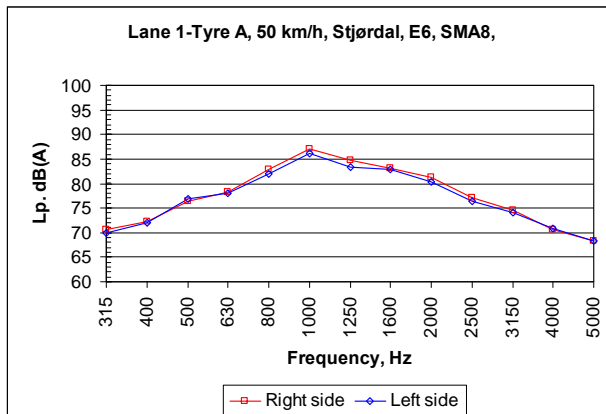


### Pavement 28: SMA8. E6 - Stjørdal, lane 1, 50 km/h

**2007:**

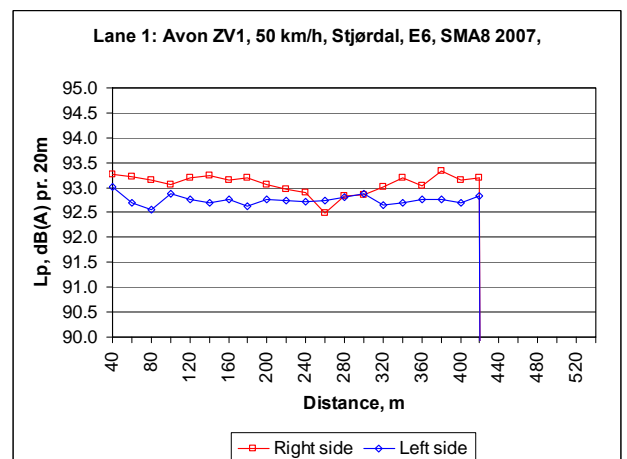
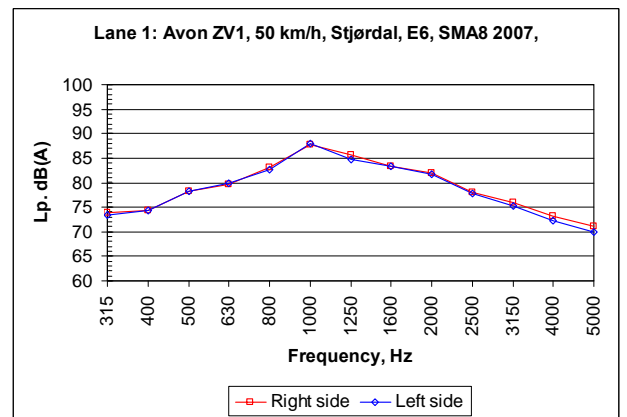
Location	Stjørdal, E6
Road surface type	SMA8
Test section length	420
Direction	Lane 1
Date	30.10.2007
Air temperature	6
Road temperature	4

Lane 1-Tyre A, 50 km/h, Stjørdal, E6, SMA8,				
Total-average speed for dist. 0 - 420 m		50.5 km/h		
Std.dev.		0.55		
dBA / Distance	Air temp Right s	6 Left s	Temp.corr. to +20C Right side	Left side
<k for dist. 0 - 420 m				
	93.0	92.2	92.1	91.4
Average for dist. 40 - 440 m				
			92.2	91.4
Std.dev.				
			0.34	0.42


**2008:**

Location	Stjørdal, E6
Road surface type	SMA8 2007
Test section length	420
Direction	Lane1
Date	30.05.2008
Air temperature	19
Road temperature	24

Lane 1: Avon ZV1, 50 km/h, Stjørdal, E6, SMA8 2007,				
Total-average speed for dist. 0 - 420 m		50.8 km/h		
Std.dev.		0.64		
dBA / Distance	Air temp Right s	19 Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 420 m				
	93.1	92.8	93.0	92.8
Average for dist. 40 - 440 m				
			93.1	92.7
Std.dev.				
			0.19	0.10

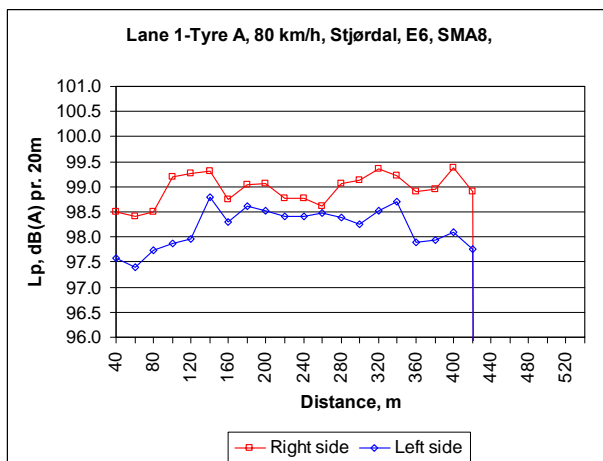
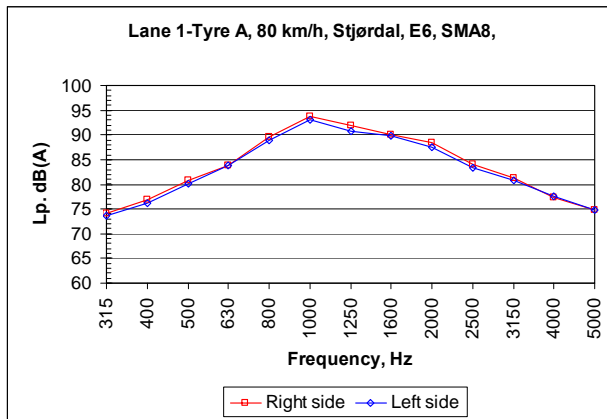


**Pavement 28: SMA8. E6 - Stjørdal, lane 1, 80 km/h**

**2007:**

Location	Stjørdal, E6
Road surface type	SMA8
Test section length	420
Direction	Lane 1
Date	30.10.2007
Air temperature	6
Road temperature	4

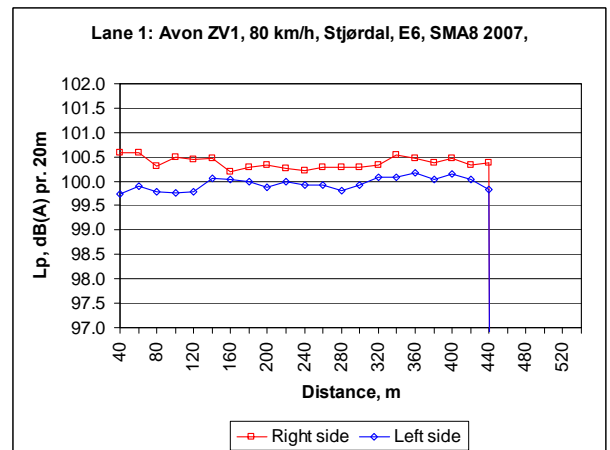
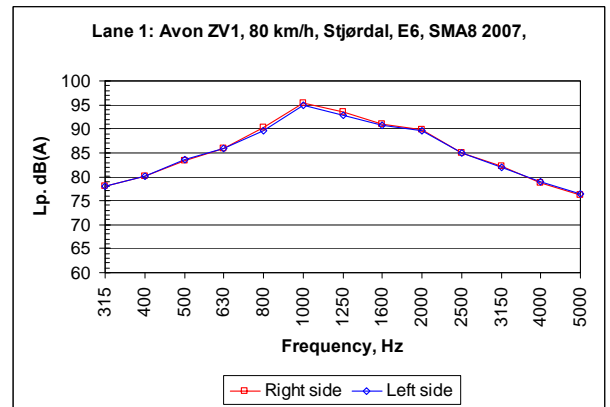
Lane 1-Tyre A, 80 km/h, Stjørdal, E6, SMA8,				
Total-average speed for dist. 0 - 420 m		80.0 km/h		
Std.dev.		0.83		
dBA / Distance	Air temp	6	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 420 m				
	99.8	99.0	98.9	98.2
Average for dist. 40 - 440 m				
			99.0	98.2
Std.dev.				
			0.30	0.39



**2008:**

Location	Stjørdal, E6
Road surface type	SMA8 2007
Test section length	440
Direction	Lane1
Date	30.05.2008
Air temperature	19
Road temperature	24

Lane 1: Avon ZV1, 80 km/h, Stjørdal, E6, SMA8 2007,				
Total-average speed for dist. 0 - 440 m		79.8 km/h		
Std.dev.		0.90		
dBA / Distance	Air temp	19	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 440 m				
	100.4	100.0	100.4	99.9
Average for dist. 40 - 460 m				
			100.4	99.9
Std.dev.				
			0.12	0.13

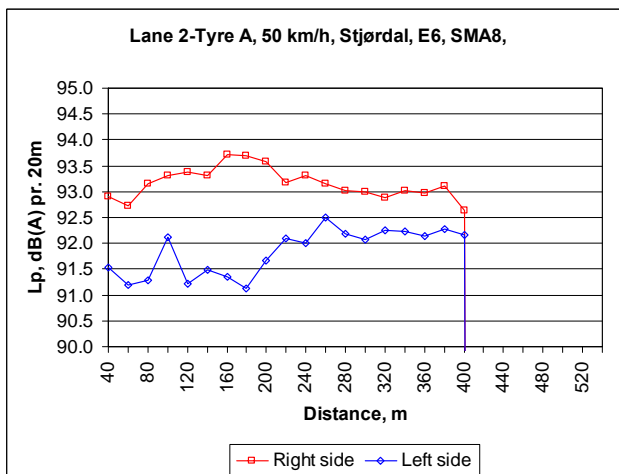
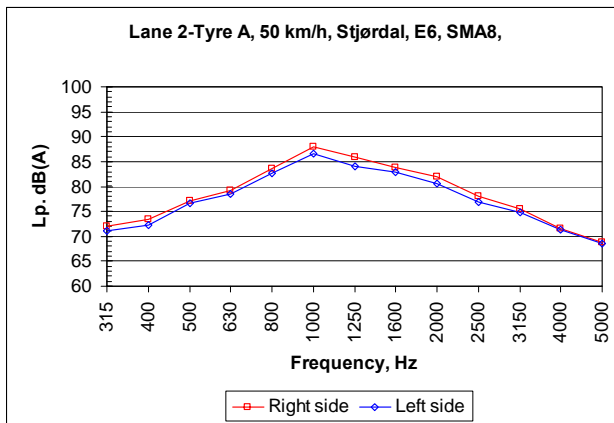


**Pavement 28: SMA8. E6 - Stjørdal, lane 2, 50 km/h**

2007:

Location	Stjørdal, E6
Road surface type	SMA8
Test section length	400
Direction	Lane 2
Date	30.10.2007
Air temperature	6
Road temperature	4

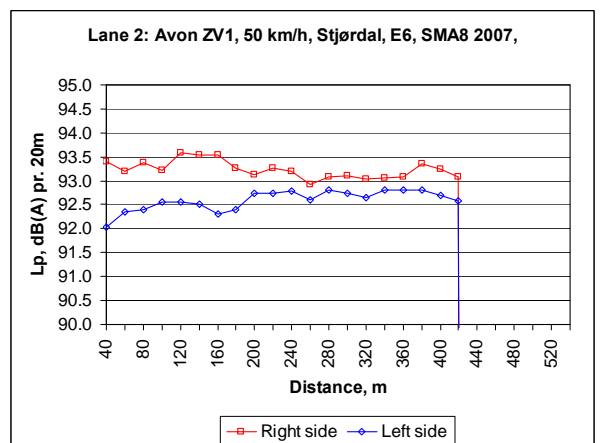
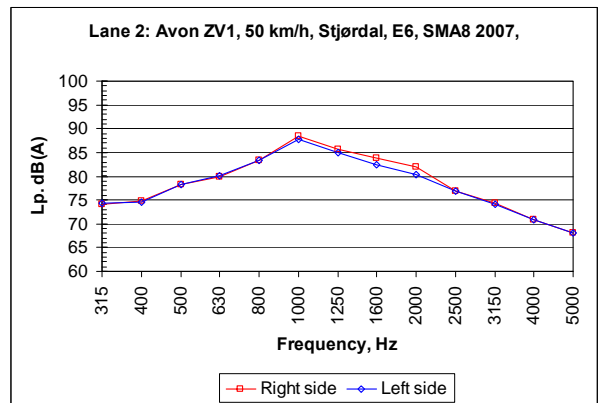
Lane 2-Tyre A, 50 km/h, Stjørdal, E6, SMA8,				
Total-average speed for dist. 0 - 400 m		50.4 km/h		
Std.dev.		0.22		
dBA / Distance	Air temp	6	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 400 m				
	94.0	92.7	93.2	91.9
Average	for dist. 40 - 420 m		93.2	91.8
Std.dev.			0.30	0.45



2008:

Location	Stjørdal, E6
Road surface type	SMA8 2007
Test section length	400
Direction	Lane 2
Date	30.05.2008
Air temperature	19
Road temperature	24

Lane 2: Avon ZV1, 50 km/h, Stjørdal, E6, SMA8 2007,				
Total-average speed for dist. 0 - 420 m		50.2 km/h		
Std.dev.		0.43		
dBA / Distance	Air temp	19	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 420 m				
	93.3	92.7	93.2	92.6
Average	for dist. 40 - 440 m		93.2	92.6
Std.dev.			0.18	0.21

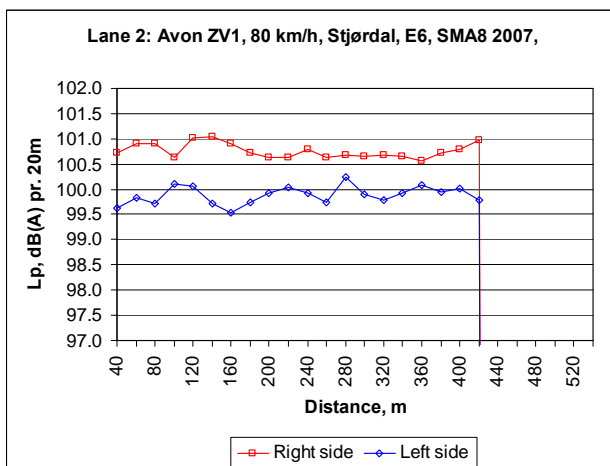
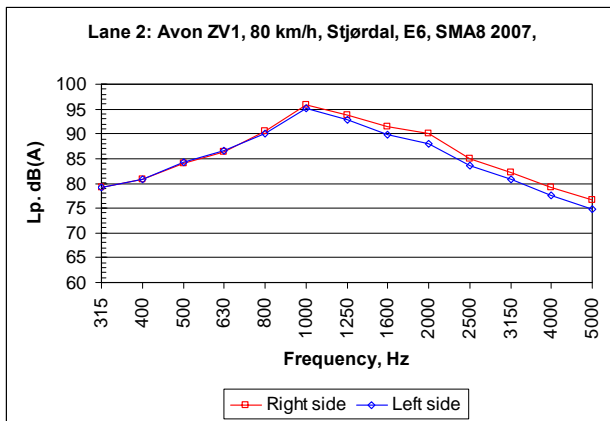


**Pavement 28: SMA8. E6 - Stjørdal, lane 2, 80 km/h**

2008:

Location	Stjørdal, E6
Road surface type	SMA8 2007
Test section length	400
Direction	Lane 2
Date	30.05.2008
Air temperature	19
Road temperature	24

Lane 2: Avon ZV1, 80 km/h, Stjørdal, E6, SMA8 2007,				
Total-average speed for dist. 0 - 420 m		80.1 km/h		
Std.dev.		0.44		
dBA / Distance	Air temp	19	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 420 m				
	100.8	99.9	100.8	99.9
Average for dist. 40 - 440 m				
	100.8	99.9	100.8	99.9
Std.dev.			0.15	0.18

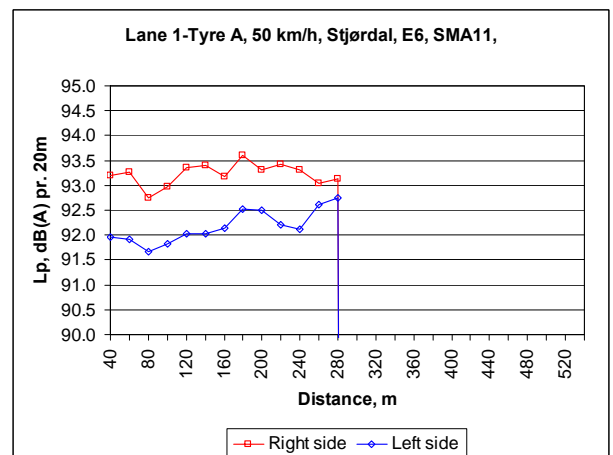
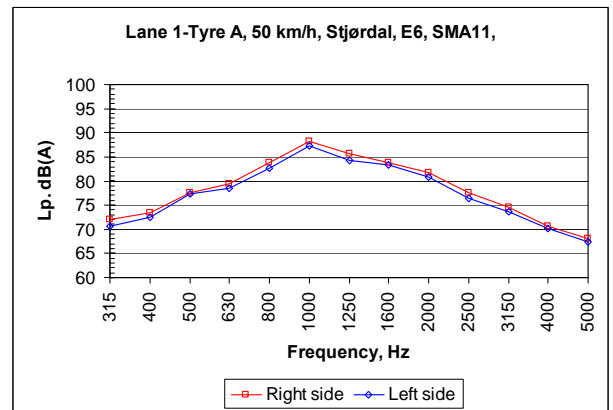


**Pavement 29: SMA11. E6 - Stjørdal, lane 1, 50 km/h**

2007:

Location	Stjørdal, E6
Road surface type	SMA11
Test section length	280
Direction	Lane 1
Date	30.10.2007
Air temperature	6
Road temperature	4

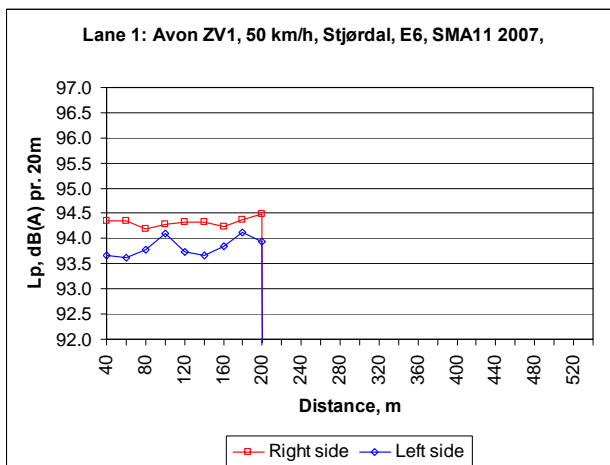
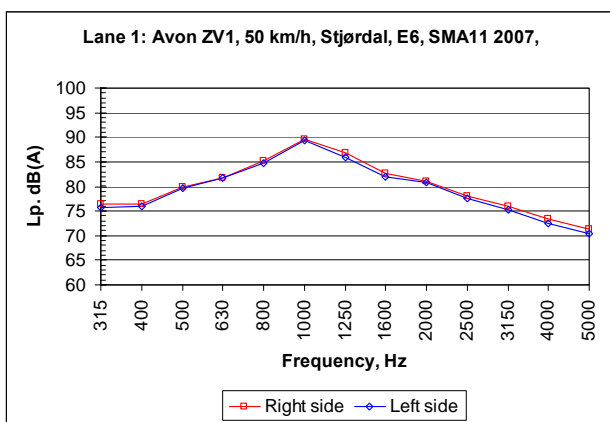
Lane 1-Tyre A, 50 km/h, Stjørdal, E6, SMA11,				
Total-average speed for dist. 0 - 280 m		50.3 km/h		
Std.dev.		0.50		
dBA / Distance	Air temp	6	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 280 m				
	94.0	92.9	93.1	92.1
Average for dist. 40 - 300 m				
	93.2	92.2	93.2	92.2
Std.dev.			0.22	0.33



2008:

Location	Stjørdal, E6
Road surface type	SMA11 2007
Test section length	200
Direction	Lane 1
Date	30.05.2008
Air temperature	19
Road temperature	24

Lane 1: Avon ZV1, 50 km/h, Stjørdal, E6, SMA11 2007,				
Total-average speed for dist. 0 - 200 m		50.4 km/h		
Std.dev.		0.46		
dBA / Distance	Air temp	Right s	Left s	Temp.corr. to +20C
				Right side
				Left side
Total-average for dist. 0 - 200 m				
		94.3	93.9	94.3 93.8
Average for dist. 40 - 220 m				94.3 93.8
Std.dev.				0.08 0.19

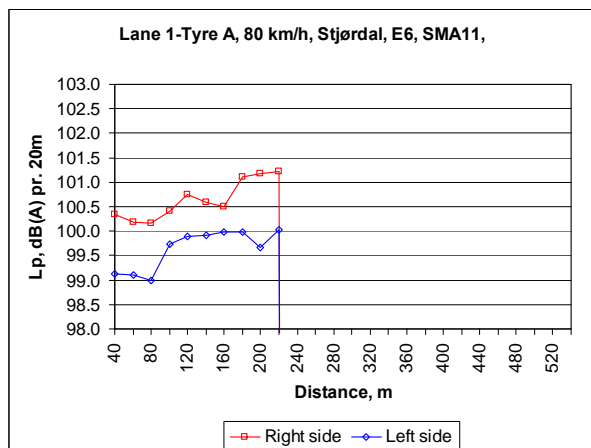
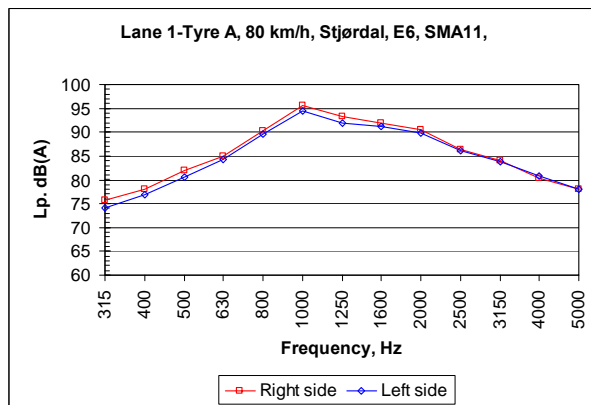


*Pavement 29: SMA11. E6 - Stjørdal, lane 1, 80 km/h*

2007:

Location	Stjørdal, E6
Road surface type	SMA11
Test section length	220
Direction	Lane 1
Date	30.10.2007
Air temperature	6
Road temperature	4

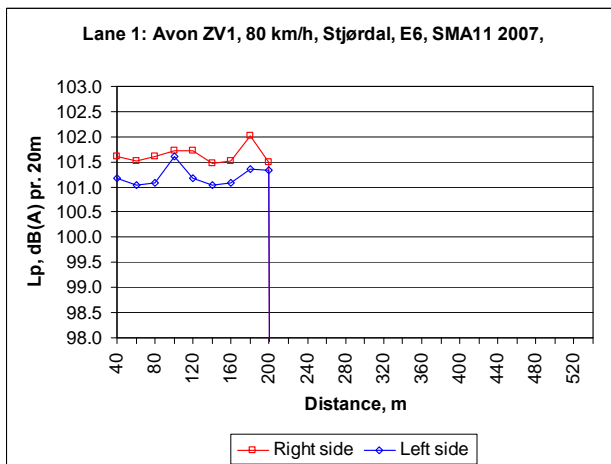
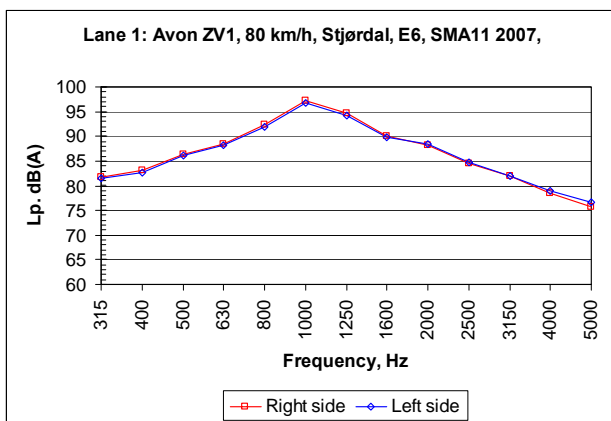
Lane 1-Tyre A, 80 km/h, Stjørdal, E6, SMA11,				
Total-average speed for dist. 0 - 220 m		78.3 km/h		
Std.dev.		1.44		
dBA / Distance	Air temp	Right s	Left s	Temp.corr. to +20C
				Right side
				Left side
<k for dist. 0 - 220 m				
		101.4	100.4	100.6 99.5
Average for dist. 40 - 240 m				100.6 99.6
Std.dev.				0.40 0.41



2008:

Location	Stjørdal, E6
Road surface type	SMA11 2007
Test section length	200
Direction	Lane 1
Date	30.05.2008
Air temperature	19
Road temperature	24

Lane 1: Avon ZV1, 80 km/h, Stjørdal, E6, SMA11 2007,				
Total-average speed for dist. 0 - 200 m		78.5 km/h		
Std.dev.		1.51		
dBA / Distance	Air temp	Right s	Left s	Temp.corr. to +20C
	19			Right side Left side
Total-average for dist. 0 - 200 m				
	101.7	101.2	101.6	101.1
Average for dist. 40 - 220 m				
			101.6	101.2
Std.dev.				
			0.17	0.19

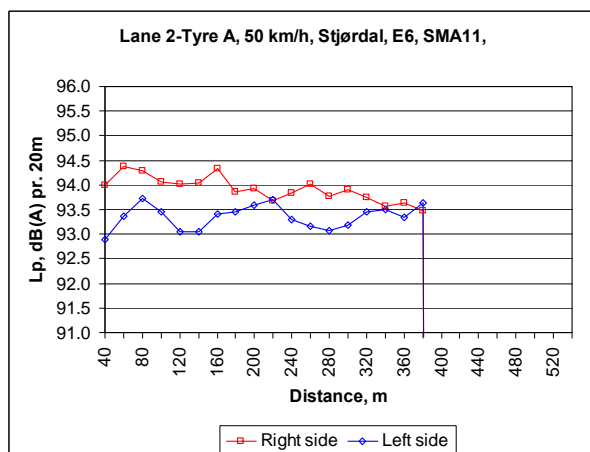
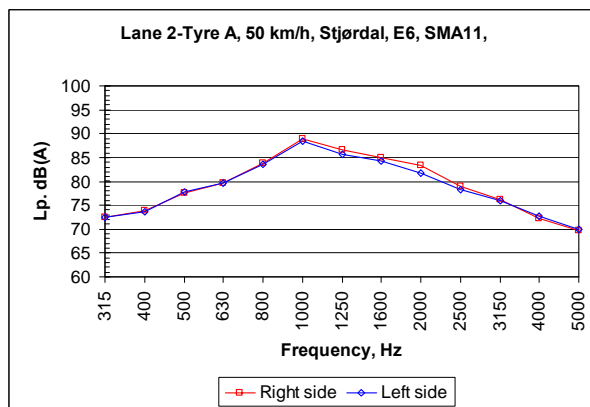


*Pavement 29: SMA11. E6 - Stjørdal, lane 2, 50 km/h*

2007:

Location	Stjørdal, E6
Road surface type	SMA11
Test section length	380
Direction	Lane 2
Date	30.10.2007
Air temperature	6
Road temperature	4

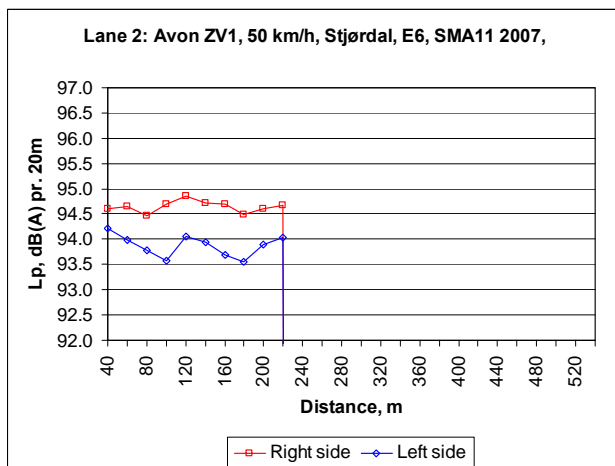
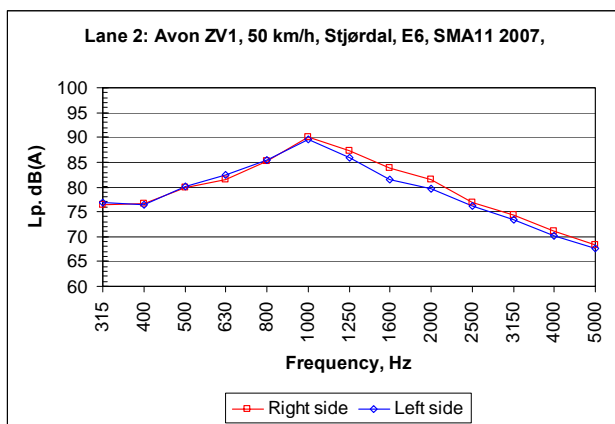
Lane 2-Tyre A, 50 km/h, Stjørdal, E6, SMA11,				
Total-average speed for dist. 0 - 380 m		50.4 km/h		
Std.dev.		0.42		
dBA / Distance	Air temp	Right s	Left s	Temp.corr. to +20C
	6			Right side Left side
<k for dist. 0 - 380 m				
	94.8	94.1	93.9	93.3
Average for dist. 40 - 400 m				
			93.9	93.4
Std.dev.				
			0.25	0.24



2008:

Location	Stjørdal, E6
Road surface type	SMA11 2007
Test section length	220
Direction	Lane 2
Date	30.05.2008
Air temperature	19
Road temperature	24

Lane 2: Avon ZV1, 50 km/h, Stjørdal, E6, SMA11 2007,				
Total-average speed for dist. 0 - 220 m		50.9 km/h		
Std.dev.		0.65		
dBA / Distance	Air temp	19	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 220 m				
	94.7	94.0	94.7	93.9
Average for dist. 40 - 240 m				
	94.6	93.9		
Std.dev.		0.11 0.22		

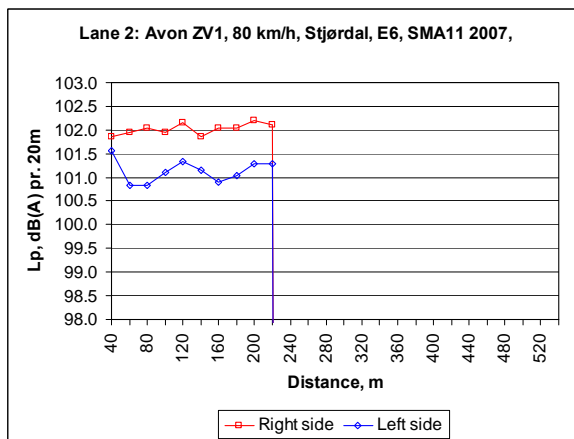
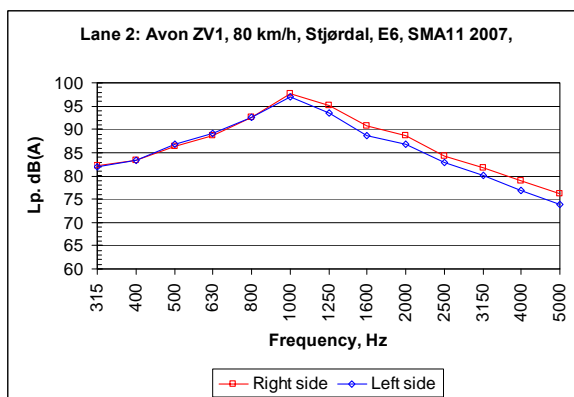


*Pavement 29: SMA11. E6 - Stjørdal, lane 2, 80 km/h*

2008:

Location	Stjørdal, E6
Road surface type	SMA11 2007
Test section length	220
Direction	Lane 2
Date	30.05.2008
Air temperature	19
Road temperature	24

Lane 2: Avon ZV1, 80 km/h, Stjørdal, E6, SMA11 2007,				
Total-average speed for dist. 0 - 220 m		79.4 km/h		
Std.dev.		1.22		
dBA / Distance	Air temp	19	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 220 m				
	102.1	101.2	102.0	101.1
Average for dist. 40 - 240 m				
	102.0	101.1		
Std.dev.		0.12 0.24		

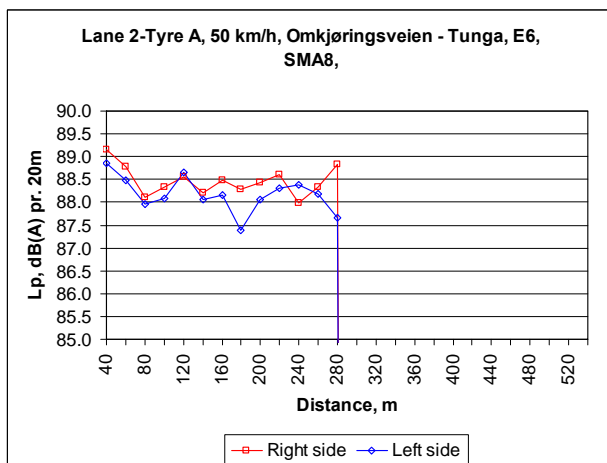
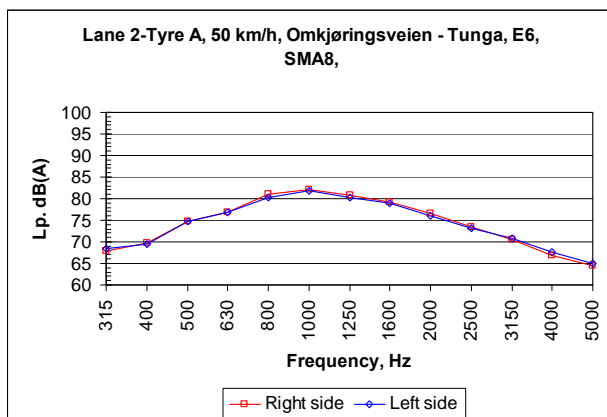


**Pavement 30: SMA8. E6 -  
Trondheim, lane 2, 50 km/h**

**2007:**

Location	Omkjøringsveien - Tunga, E6		
Road surface type	SMA8		
Test section length	280		
Direction	Lane 2		
Date	22.08.2007		
Air temperature			18
Road temperature			22

Lane 2-Tyre A, 50 km/h, Omkjøringsveien - Tunga, E6, SMA8,				
Total-average speed for dist. 0 - 280 m		50.5 km/h		
Std.dev.		0.50		
dB(A) / Distance	Air temp Right s	18 Left s	Temp.corr. to +20C Right side	Left side
<k for dist. 0 - 280 m				
	88.8	88.3	88.6	88.2
Average for dist. 40 - 300 m				
Std.dev.			0.32	0.39

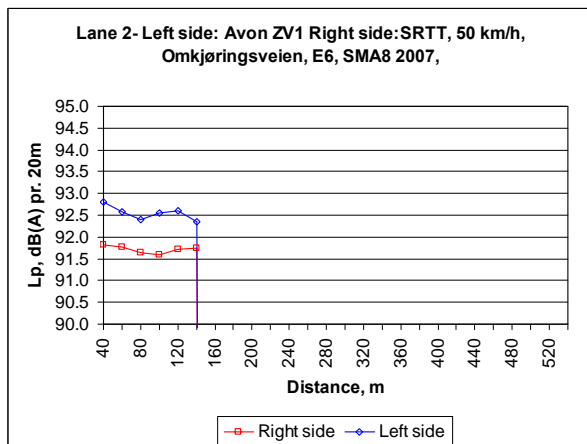
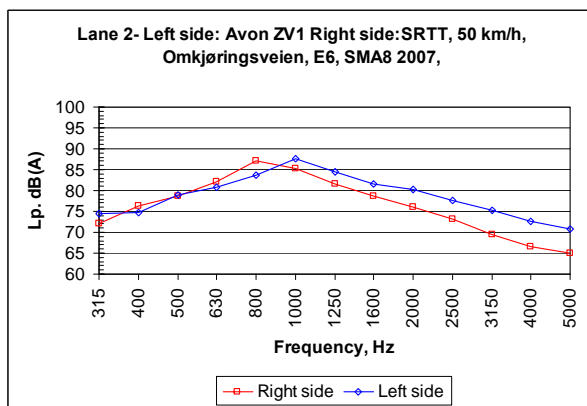


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Omkjøringsveien, E6		
Road surface type	SMA8 2007		
Test section length	250		
Direction	Lane 2		
Date	29.05.2008		
Air temperature			21
Road temperature			30

Lane 2- Left side: Avon ZV1 Right side:SRTT, 50 km/h, Omkjøringsveien, E6, SMA8 2007,				
Total-average speed for dist. 0 - 140 m		50.3 km/h		
Std.dev.		0.76		
dB(A) / Distance	Air temp Right s	21 Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 140 m				
	91.7	92.5	91.8	92.6
Average for dist. 40 - 160 m				
Std.dev.			0.08	0.16



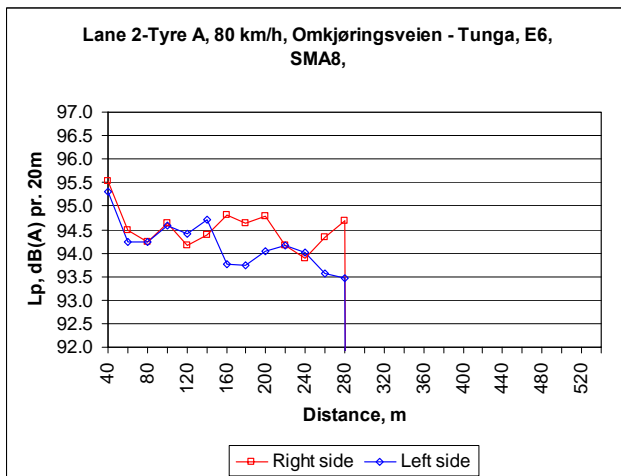
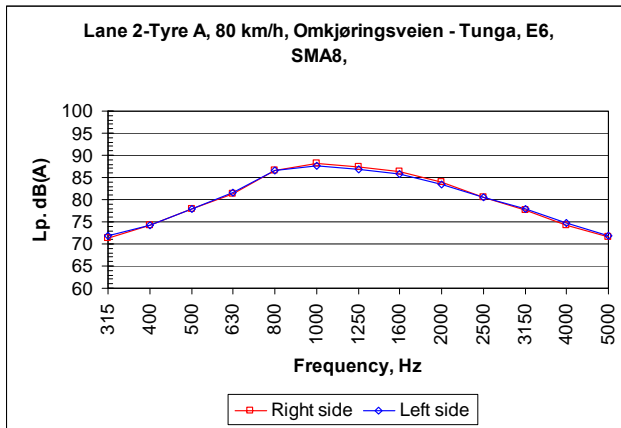


**Pavement 30: SMA8. E6 -  
Trondheim, lane 2, 80 km/h**

**2007:**

Location	Omkjøringsveien - Tunga, E6	
Road surface type	SMA8	
Test section length	280	
Direction	Lane 2	
Date	22.08.2007	
Air temperature		18
Road temperature		22

Lane 2-Tyre A, 80 km/h, Omkjøringsveien - Tunga, E6, SMA8,				
Total-average speed for dist. 0 - 280 m		80.0 km/h		
Std.dev.		0.66		
dBA / Distance	Air temp	Right s	Left s	Temp.corr. to +20C
	Right s	Left s	Right side	Left side
<k for dist. 0 - 280 m				
	94.8	94.4	94.7	94.3
Average	for dist. 40 - 300 m		94.5	94.2
Std.dev.			0.41	0.51

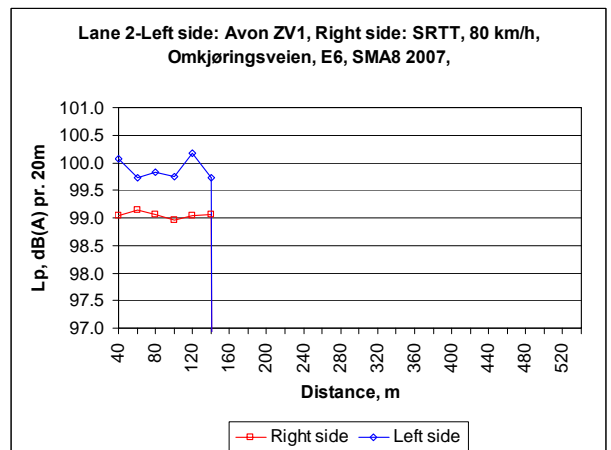
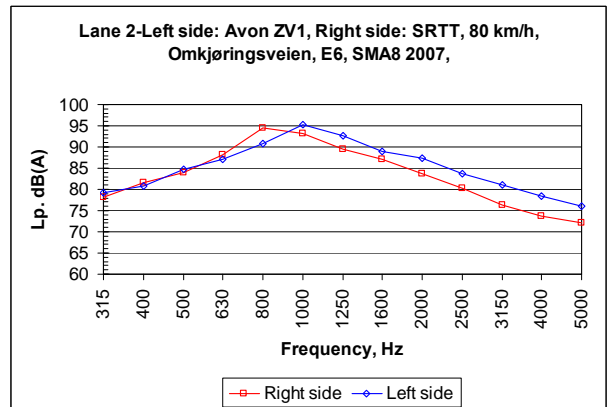


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Omkjøringsveien, E6	
Road surface type	SMA8 2007	
Test section length	140	
Direction	Lane 2	
Date	29.05.2008	
Air temperature		21
Road temperature		30

Lane 2-Left side: Avon ZV1, Right side: SRTT, 80 km/h, Omkjøringsveien, E6, SMA8 2007,				
Total-average speed for dist. 0 - 140 m		80.4 km/h		
Std.dev.		0.12		
dBA / Distance	Air temp	Right s	Left s	Temp.corr. to +20C
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 140 m				
	99.0	99.8	99.1	99.9
Average	for dist. 40 - 160 m		99.0	99.9
Std.dev.			0.06	0.19

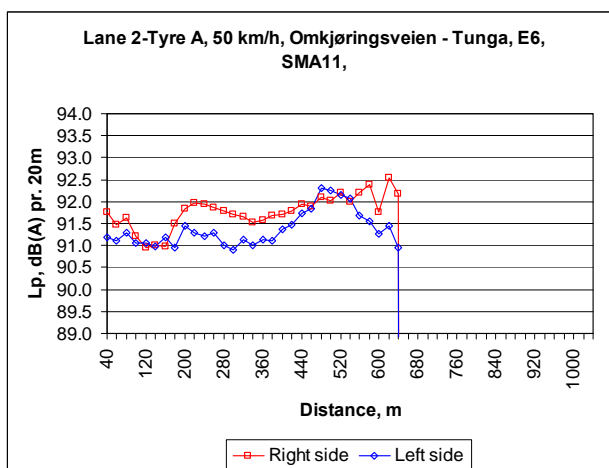
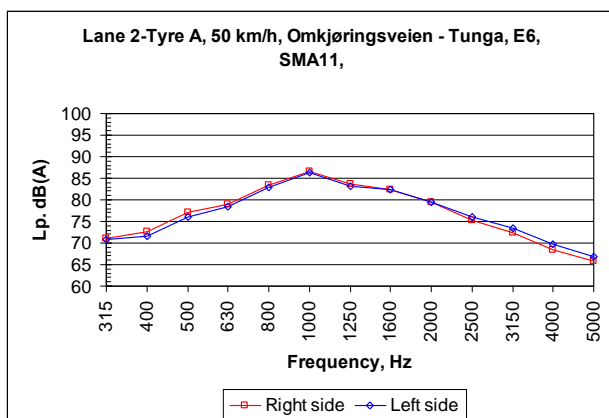


**Pavement 31: SMA11. E6 -  
Trondheim, lane 2, 50 km/h**

2007:

Location	Omkjøringsveien - Tunga, E6	
Road surface type	SMA11	
Test section length	640	
Direction	Lane 2	
Date	22.08.2007	
Air temperature		18
Road temperature		22

Lane 2-Tyre A, 50 km/h, Omkjøringsveien - Tunga, E6, SMA11,				
Total-average speed for dist. 0 - 640 m		50.8 km/h		
Std.dev.		0.78		
dBA / Distance	Air temp	18	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 640 m				
	91.9	91.5	91.8	91.4
Average	for dist. 40 - 660 m		91.8	91.4
Std.dev.			0.38	0.40

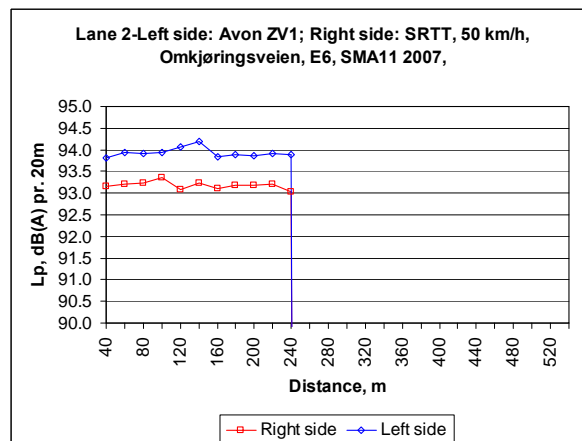
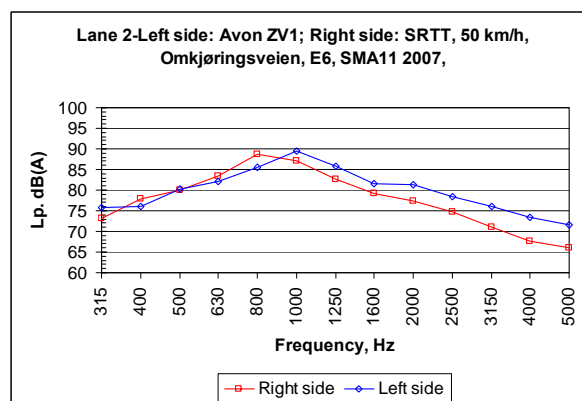


2008:

(Note: Tyre A on left side of CPX-trailer,  
SRTT-tyre on right side)

Location	Omkjøringsveien, E6	
Road surface type	SMA11 2007	
Test section length	250	
Direction	Lane 2	
Date	29.05.2008	
Air temperature		21
Road temperature		30

Lane 2-Left side: Avon ZV1; Right side: SRTT, 50 km/h, Omkjøringsveien, E6, SMA11 2007,				
Total-average speed for dist. 0 - 240 m		50.0 km/h		
Std.dev.		0.31		
dBA / Distance	Air temp	21	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 240 m				
	93.1	93.9	93.2	93.9
Average	for dist. 40 - 260 m		93.2	93.9
Std.dev.			0.09	0.11

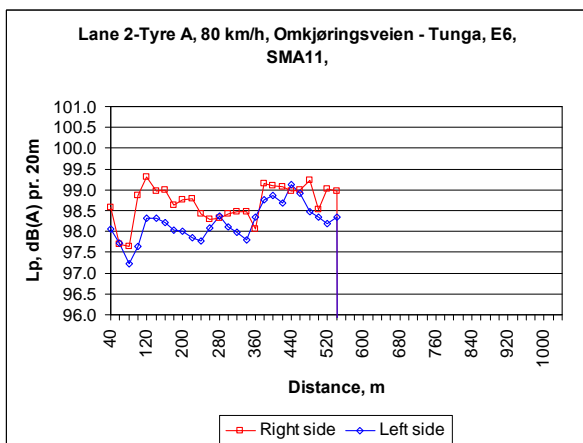
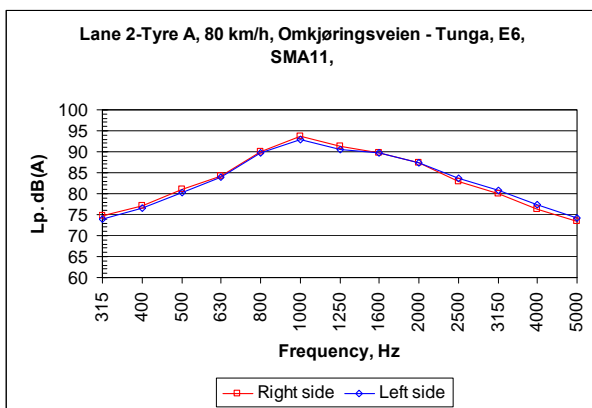


**Pavement 31: SMA11. E6 -  
Trondheim, lane 2, 80 km/h**

**2007:**

Location	Omkjøringsveien - Tunga, E6		
Road surface type	SMA11		
Test section length	540		
Direction	Lane 2		
Date	22.08.2007		
Air temperature			18
Road temperature			22

Lane 2-Tyre A, 80 km/h, Omkjøringsveien - Tunga, E6, SMA11,				
Total-average speed for dist. 0 - 540 m		79.4 km/h		
Std.dev.		1.03		
dB(A) / Distance	Air temp Right s	18 Left s	Temp.corr. to +20C Right side	Left side
<k for dist. 0 - 540 m				
	98.8	98.3	98.7	98.2
Average for dist. 40 - 560 m			98.7	98.2
Std.dev.			0.44	0.43

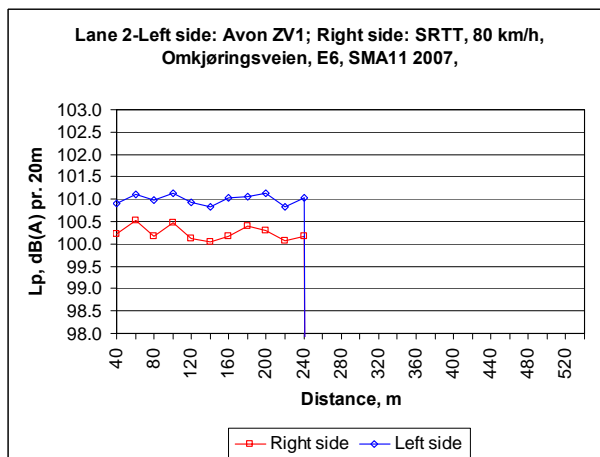
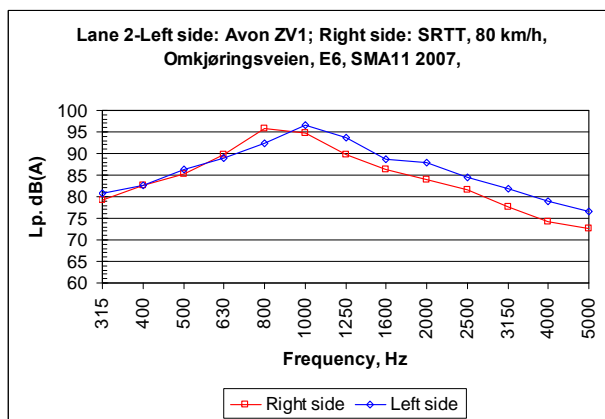


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Omkjøringsveien, E6
Road surface type	SMA11 2007
Test section length	240
Direction	Lane 2
Date	29.05.2008
Air temperature	21
Road temperature	30

Lane 2-Left side: Avon ZV1; Right side: SRTT, 80 km/h, Omkjøringsveien, E6, SMA11 2007,				
Total-average speed for dist. 0 - 240 m		79.5 km/h		
Std.dev.		0.36		
dB(A) / Distance	Air temp Right s	21 Left s	Temp.corr. to +20C Right side	Left side
Total-average for dist. 0 - 240 m				
	100.2	100.9	100.3	101.0
Average for dist. 40 - 260 m			100.2	101.0
Std.dev.			0.16	0.11

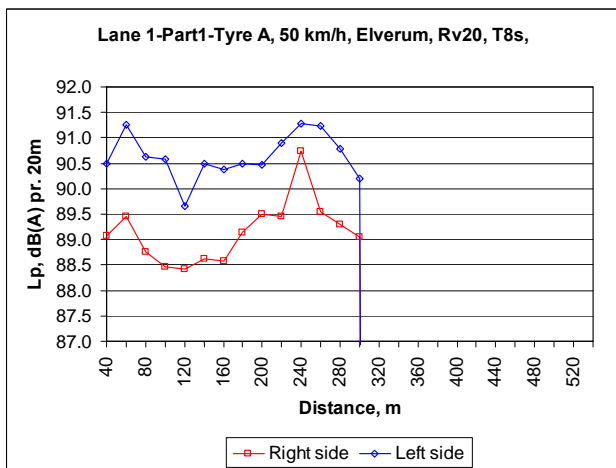
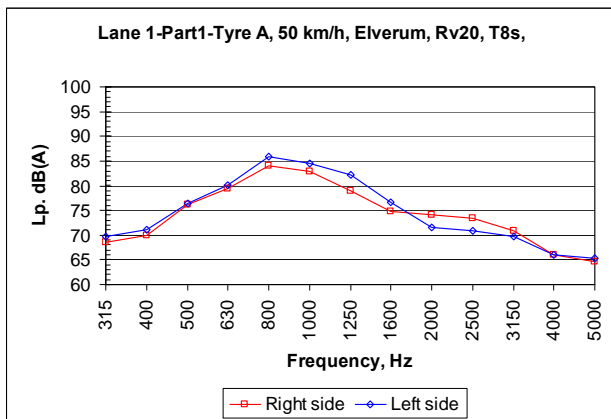


**Pavement 32: T8s, Rv20 – Elverum, lane 1 – part 1, 50 km/h**

**2007:**

Location	Elverum, Rv20
Road surface type	T8s
Test section length	300
Direction	Lane 1 Part1
Date	19.09.2007
Air temperature	9
Road temperature	8

Lane 1-Part1-Tyre A, 50 km/h, Elverum, Rv20, T8s,				
Total-average speed for dist. 0 - 300 m		50.5 km/h		
Std.dev.		0.13		
dBA / Distance	Air temp Right s Left s	Temp.corr. to +20C Right side Left side		
<k for dist. 0 - 300 m				
	89.7	91.3	89.1	90.6
Average for dist. 40 - 320 m			89.1	90.6
Std.dev.			0.61	0.44

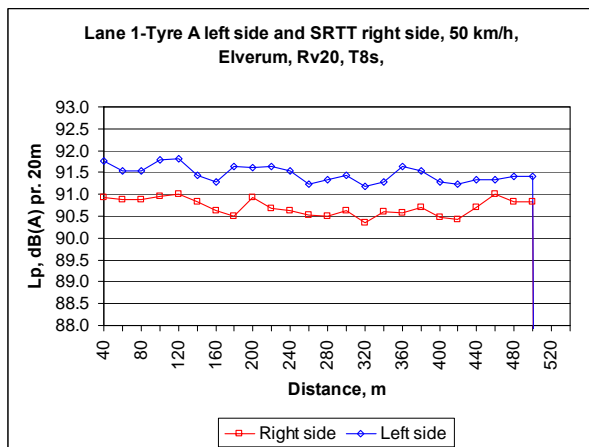
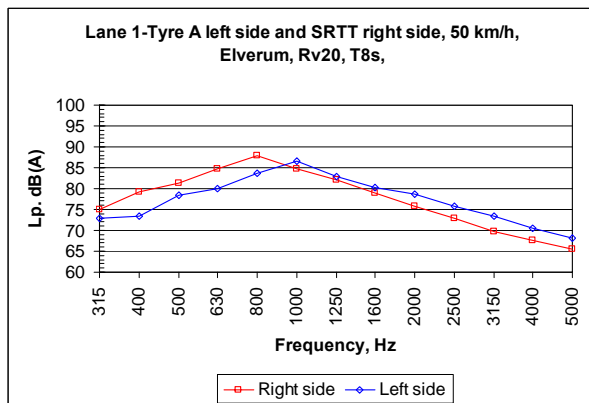


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Elverum, Rv20
Road surface type	T8s
Test section length	500
Direction	Lane 1 (Part 1)
Date	25.06.2008
Air temperature	23
Road temperature	32

Lane 1-Tyre A left side and SRTT right side, 50 km/h, Elverum, Rv20,				
Total-average speed for dist. 0 - 500 m		51.9 km/h		
Std.dev.		0.78		
dBA / Distance	Air temp Right s Left s	Temp.corr. to +20C Right side Left side		
Total-average for dist. 0 - 500 m				
	90.5	91.3	90.7	91.5
Average for dist. 40 - 520 m			90.7	91.5
Std.dev.			0.20	0.19

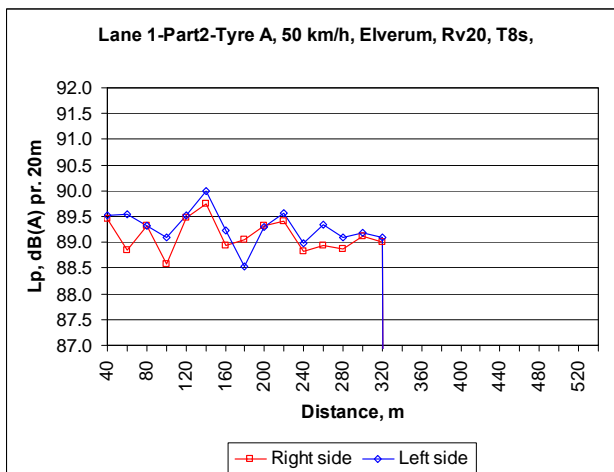
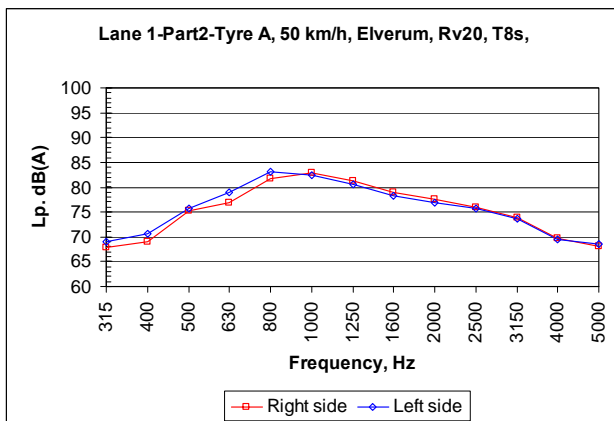


**Pavement 32: T8s, Rv20 – Elverum, lane 1 – part 2, 50 km/h**

2007:

Location	Elverum, Rv20
Road surface type	T8s
Test section length	320
Direction	Lane 1 Part2
Date	19.09.2007
Air temperature	9
Road temperature	8

Lane 1-Part2-Tyre A, 50 km/h, Elverum, Rv20, T8s,				
Total-average speed for dist. 0 - 320 m		50.4 km/h		
Std.dev.		0.45		
dBA / Distance	Air temp	9	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 320 m				
	89.8	90.0	89.2	89.3
Average	for dist. 40 - 340 m		89.1	89.3
Std.dev.			0.32	0.34

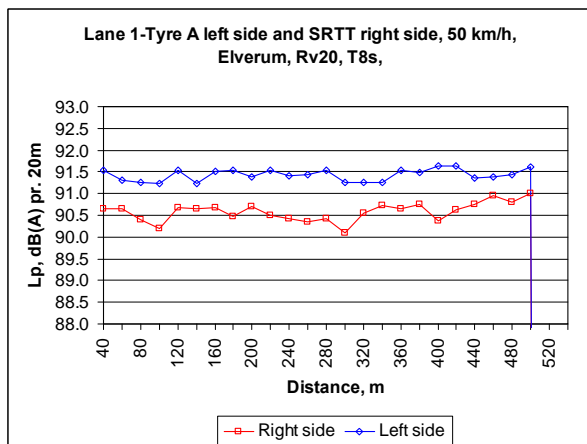
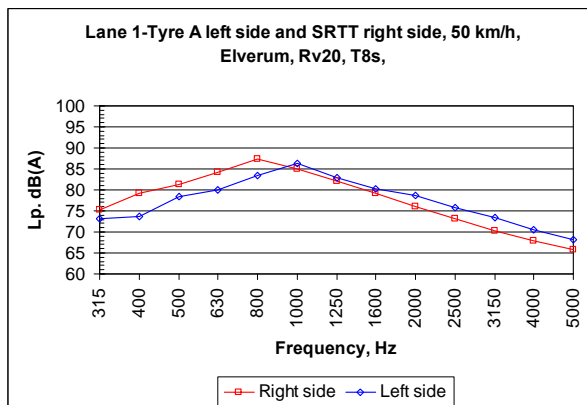


2008:

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Elverum, Rv20
Road surface type	T8s
Test section length	500
Direction	Lane 1 (Part 2)
Date	25.06.2008
Air temperature	23
Road temperature	32

Lane 1-Tyre A left side and SRTT right side, 50 km/h, Elverum, Rv20,				
Total-average speed for dist. 0 - 500 m		51.7 km/h		
Std.dev.		1.32		
dBA / Distance	Air temp	23	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 500 m				
	90.4	91.3	90.6	91.4
Average	for dist. 40 - 520 m		90.6	91.4
Std.dev.			0.22	0.14

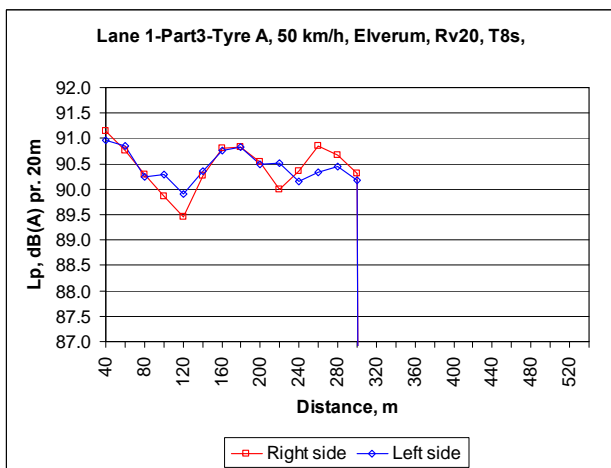
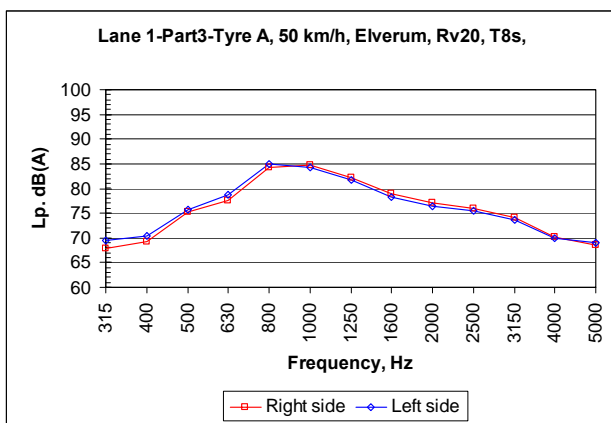


**Pavement 32: T8s, Rv20 – Elverum, lane 1 – part 3, 50 km/h**

2007:

Location	Elverum, Rv20
Road surface type	T8s
Test section length	300
Direction	Lane 1 Part3
Date	19.09.2007
Air temperature	9
Road temperature	8

Lane 1-Part3-Tyre A, 50 km/h, Elverum, Rv20, T8s,				
Total-average speed for dist. 0 - 300 m		50.5 km/h		
Std.dev.		0.25		
dB(A) / Distance	Air temp	9	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 300 m				
	91.1	91.1	90.4	90.5
Average for dist. 40 - 320 m				
			90.4	90.5
Std.dev.				
			0.45	0.31

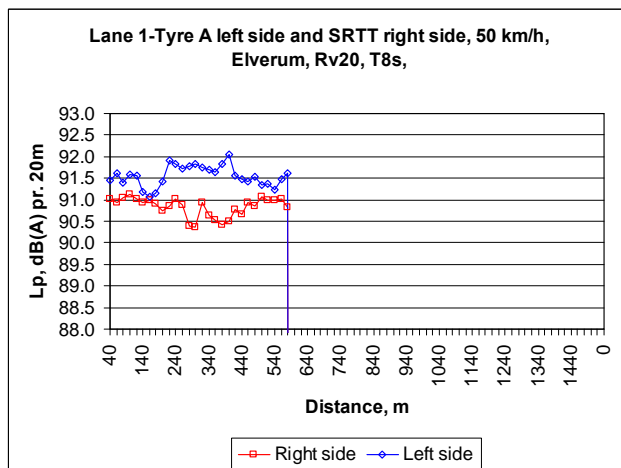
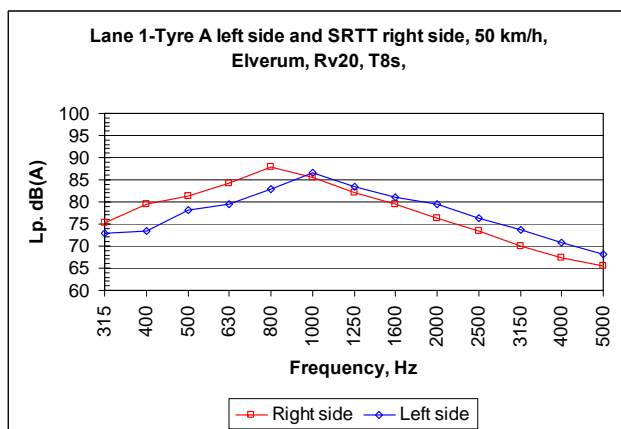


2008:

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Elverum, Rv20
Road surface type	T8s
Test section length	580
Direction	Lane 1 (Part 3)
Date	25.06.2008
Air temperature	23
Road temperature	32

Lane 1-Tyre A left side and SRTT right side, 50 km/h, Elverum, Rv20, T8s,				
Total-average speed for dist. 0 - 580 m		52.0 km/h		
Std.dev.		1.10		
dB(A) / Distance	Air temp	23	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 580 m				
	90.7	91.4	90.9	91.6
Average for dist. 40 - 600 m				
			90.8	91.6
Std.dev.				
			0.22	0.24

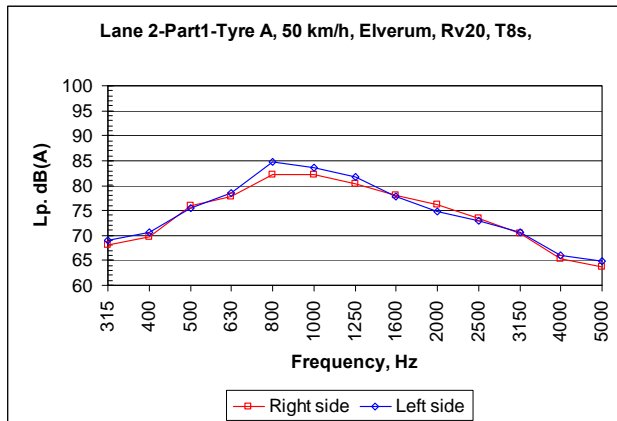


**Pavement 32: T8s, Rv20 –Elverum, lane 2 – part 1, 50 km/h**

2007:

Location	Elverum, Rv20
Road surface type	T8s
Test section length	300
Direction	Lane 2 Part1
Date	19.09.2007
Air temperature	9
Road temperature	8

Lane 2-Part1-Tyre A, 50 km/h, Elverum, Rv20, T8s,				
Total-average speed for dist. 0 - 300 m		50.5 km/h		
Std.dev.		0.15		
dBA / Distance	Air temp	9	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 300 m				
	89.4	90.6	88.7	89.9
Average for dist. 40 - 320 m				
			88.7	90.0
Std.dev.				
			0.42	0.53

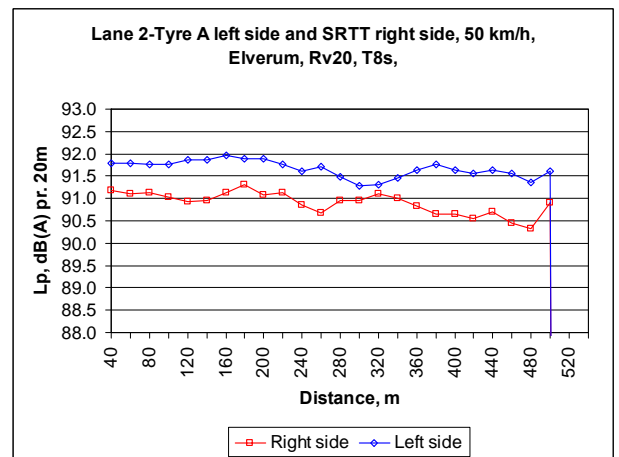
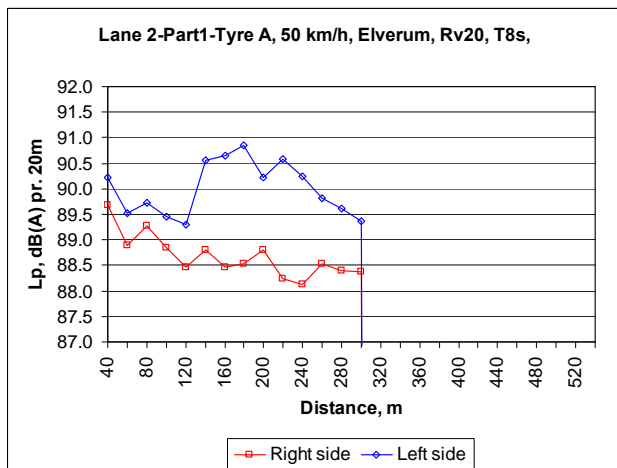
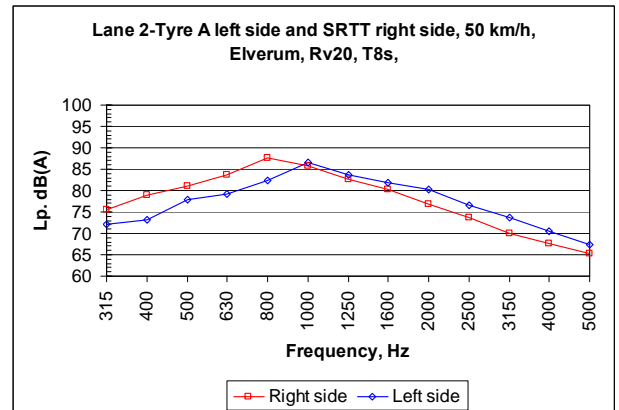


2008:

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Elverum, Rv20
Road surface type	T8s
Test section length	500
Direction	Lane 2 (Part 1)
Date	25.06.2008
Air temperature	23
Road temperature	32

Lane 2-Tyre A left side and SRTT right side, 50 km/h, Elverum, Rv20, T8s,				
Total-average speed for dist. 0 - 500 m		50.3 km/h		
Std.dev.		0.88		
dBA / Distance	Air temp	23	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 500 m				
	90.7	91.5	90.9	91.7
Average for dist. 40 - 520 m				
			90.9	91.7
Std.dev.				
			0.25	0.19

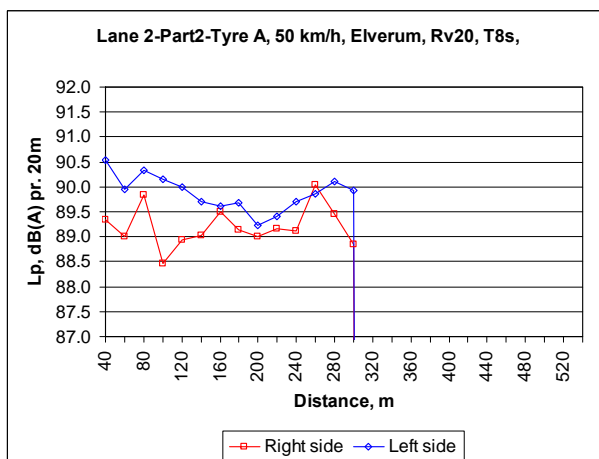
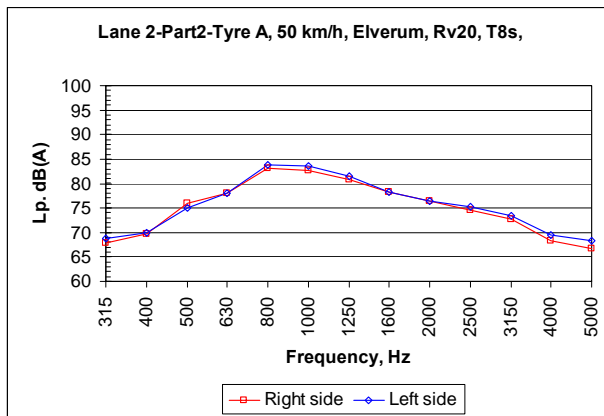


**Pavement 32: T8s, Rv20 –Elverum, lane 2 – part 2, 50 km/h**

**2007:**

Location	Elverum, Rv20
Road surface type	T8s
Test section length	300
Direction	Lane 2 Part2
Date	19.09.2007
Air temperature	9
Road temperature	8

<b>Lane 2-Part2-Tyre A, 50 km/h, Elverum, Rv20, T8s,</b>				
Total-average speed for dist. 0 - 300 m		50.4 km/h		
Std.dev.		0.31		
dBA / Distance	Air temp	9	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 300 m				
	90.0	90.5	89.3	89.9
Average	for dist. 40 - 320 m		89.2	89.9
Std.dev.			0.41	0.35

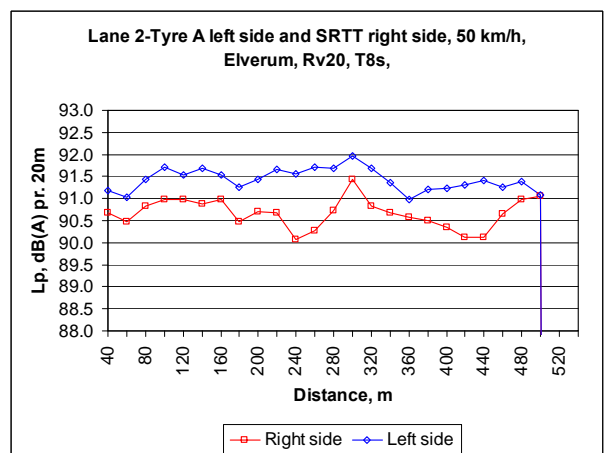
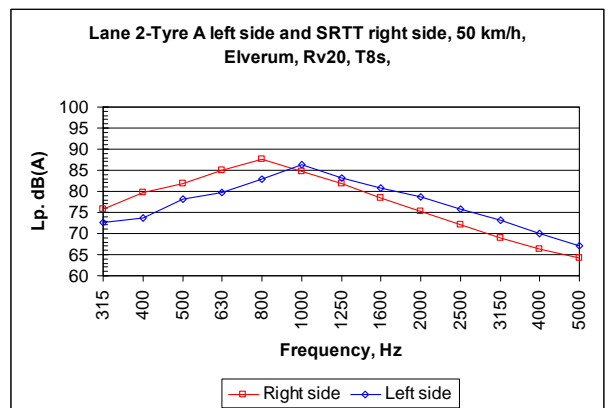


**2008:**

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Elverum, Rv20
Road surface type	T8s
Test section length	500
Direction	Lane 2 (Part 2)
Date	25.06.2008
Air temperature	23
Road temperature	32

<b>Lane 2-Tyre A left side and SRTT right side, 50 km/h, Elverum, Rv20,</b>				
Total-average speed for dist. 0 - 500 m		49.4 km/h		
Std.dev.		1.76		
dBA / Distance	Air temp	23	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 500 m				
	90.5	91.2	90.7	91.4
Average	for dist. 40 - 520 m		90.7	91.4
Std.dev.			0.33	0.25



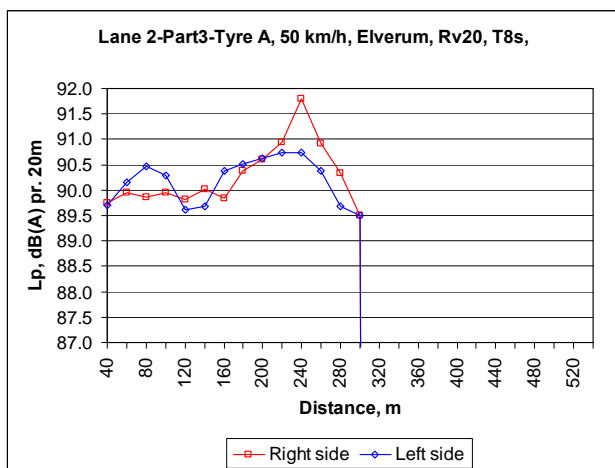
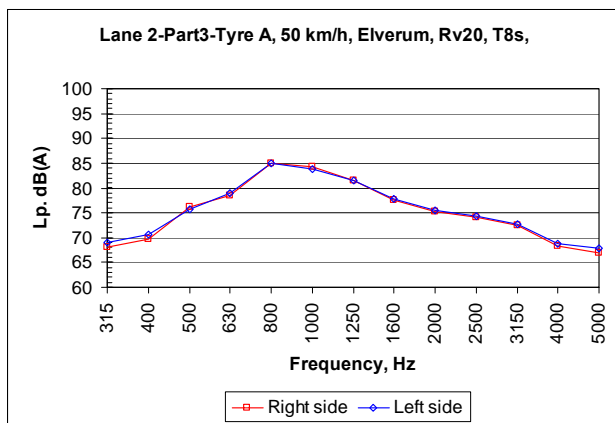


**Pavement 32: T8s, Rv20 –Elverum, lane 2 – part 3, 50 km/h**

2007:

Location	Elverum, Rv20
Road surface type	T8s
Test section length	300
Direction	Lane 2 Part3
Date	19.09.2007
Air temperature	9
Road temperature	8

Lane 2-Part3-Tyre A, 50 km/h, Elverum, Rv20, T8s,				
Total-average speed for dist. 0 - 300 m		50.5 km/h		
Std.dev.		0.16		
dBA / Distance	Air temp	9	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
<k for dist. 0 - 300 m				
	90.8	90.8	90.1	90.1
Average	for dist. 40 - 320 m		90.3	90.2
Std.dev.			0.62	0.45

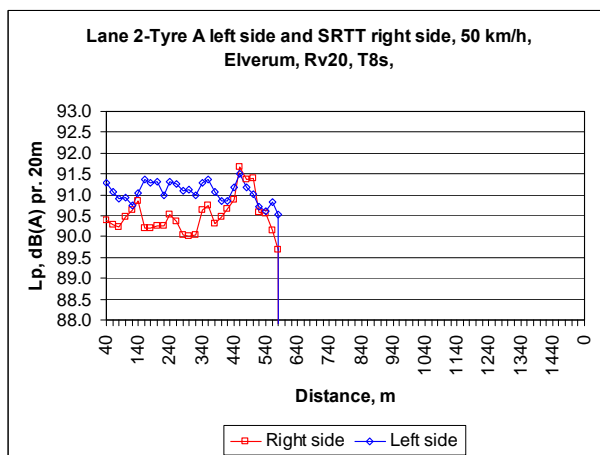
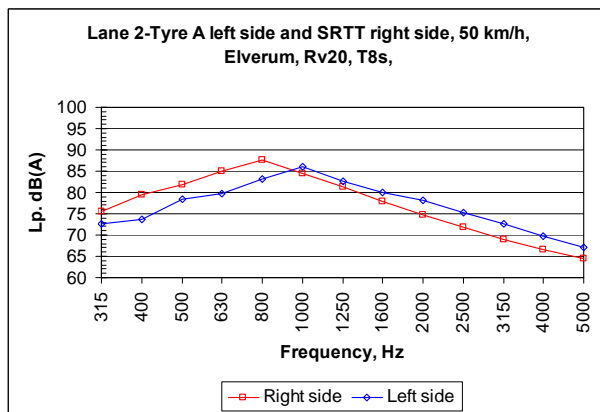


2008:

(Note: Tyre A on left side of CPX-trailer, SRTT-tyre on right side)

Location	Elverum, Rv20
Road surface type	T8s
Test section length	580
Direction	Lane 2 (Part 3)
Date	25.06.2008
Air temperature	23
Road temperature	32

Lane 2-Tyre A left side and SRTT right side, 50 km/h, Elverum, Rv20,				
Total-average speed for dist. 0 - 580 m		50.1 km/h		
Std.dev.		0.61		
dBA / Distance	Air temp	23	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 580 m				
	90.3	90.9	90.5	91.1
Average for dist. 40 - 600 m				
Std.dev.			0.44	0.24



**Pavement 33: AC6. Rv62 – Eidsvåg, lane 1, 50 km/h**

**Pavement 33: AC6. Rv62 – Eidsvåg, lane 2, 50 km/h**

2008:

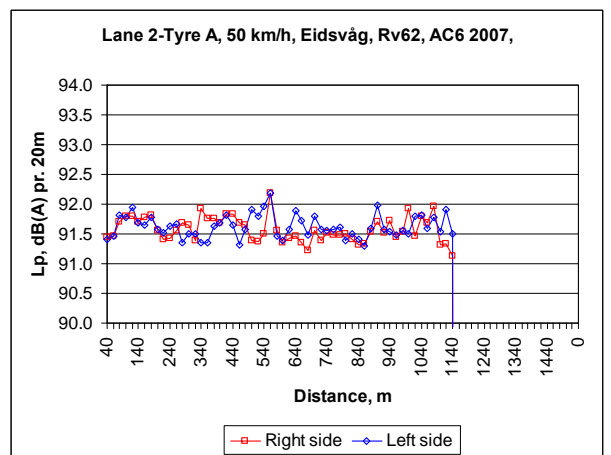
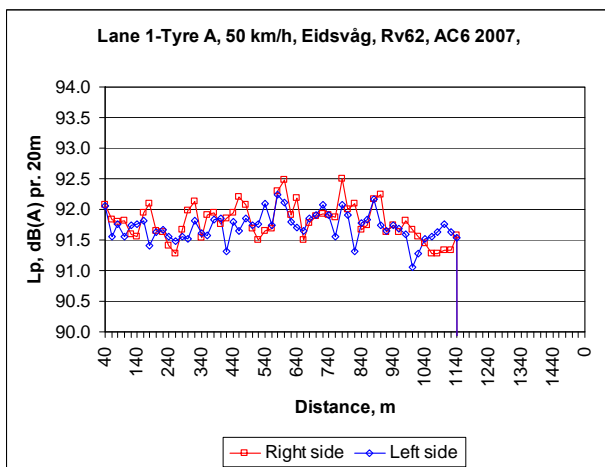
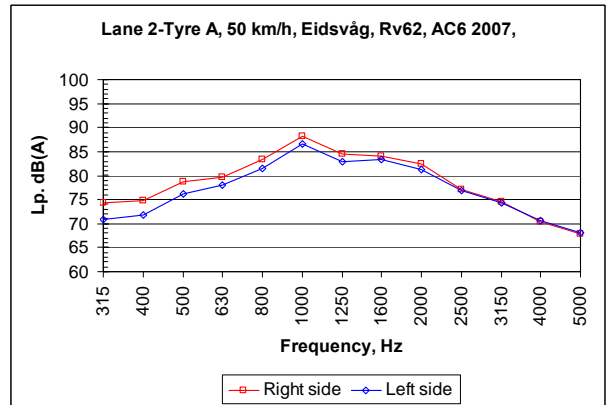
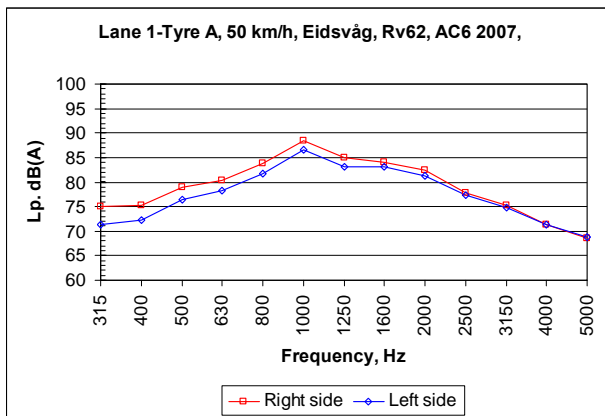
Location	Eidsvåg, Rv62
Road surface type	AC6 2007
Test section length	1140
Direction	Lane 1
Date	10.07.2008
Air temperature	14
Road temperature	22

2008:

Location	Eidsvåg, Rv62
Road surface type	AC6 2007
Test section length	1140
Direction	Lane 2
Date	10.07.2008
Air temperature	14
Road temperature	22

Lane 1-Tyre A, 50 km/h, Eidsvåg, Rv62, AC6 2007,					
Total-average speed for dist. 0 - 1140 m		50.2		km/h	
Std.dev.		1.66			
dBA / Distance	Air temp	14	Temp.corr. to +20C		
	Right s	Left s	Right side	Left side	
Total-average for dist. 0 - 1140 m					
	92.2	92.1	91.8	91.7	
Average for dist. 40 - 1160 m					
			91.8	91.7	
Std.dev.					
			0.29	0.23	

Lane 2-Tyre A, 50 km/h, Eidsvåg, Rv62, AC6 2007,					
Total-average speed for dist. 0 - 1140 m		50.7		km/h	
Std.dev.		1.09			
dBA / Distance	Air temp	14	Temp.corr. to +20C		
	Right s	Left s	Right side	Left side	
Total-average for dist. 0 - 1140 m					
	91.9	92.0	91.6	91.6	
Average for dist. 40 - 1160 m					
			91.6	91.6	
Std.dev.					
			0.21	0.19	



**Pavement 34: ViaStab8. Rv118 – Rygge, lane 1, 50 km/h**

**Pavement 34: ViaStab8. Rv118 – Rygge, lane 2, 50 km/h**

2008:

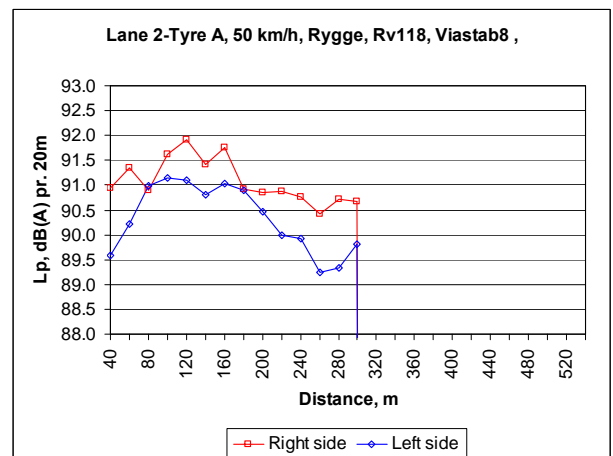
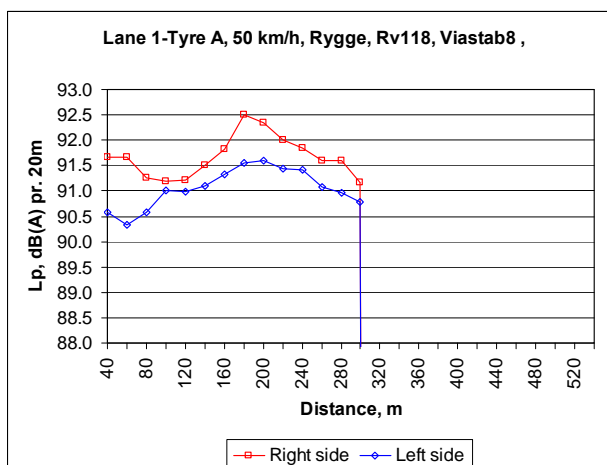
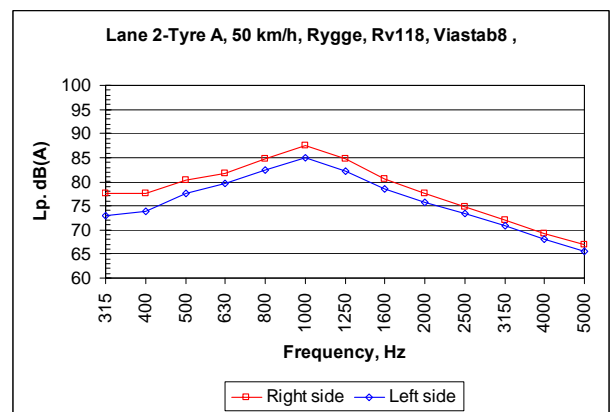
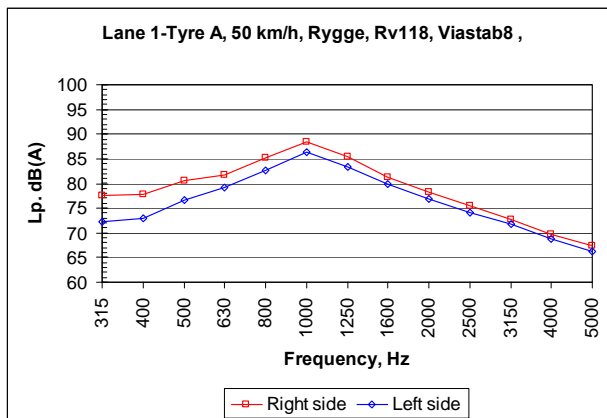
Location	Rygge, Rv118
Road surface type	Viastab8
Test section length	300
Direction	Lane 1
Date	25.06.2008
Air temperature	17
Road temperature	18

2008:

Location	Rygge, Rv118
Road surface type	Viastab8
Test section length	300
Direction	Lane 2
Date	25.06.2008
Air temperature	17
Road temperature	18

Lane 1-Tyre A, 50 km/h, Rygge, Rv118, Viastab8 ,					
Total-average speed for dist. 0 - 300 m		50.1		km/h	
Std.dev.		0.84			
dBA / Distance	Air temp	17	Temp.corr. to +20C		
	Right s	Left s	Right side	Left side	
Total-average	for dist. 0 - 300 m				
	91.8	91.3	91.7	91.1	
Average	for dist. 40 - 320 m		91.7	91.1	
Std.dev.			0.41	0.39	

Lane 2-Tyre A, 50 km/h, Rygge, Rv118, Viastab8 ,					
Total-average speed for dist. 0 - 300 m		50.9		km/h	
Std.dev.		0.73			
dBA / Distance	Air temp	17	Temp.corr. to +20C		
	Right s	Left s	Right side	Left side	
Total-average	for dist. 0 - 300 m				
	91.3	90.4	91.1	90.2	
Average	for dist. 40 - 320 m		91.1	90.3	
Std.dev.			0.45	0.68	



**Pavement 35: Sealastic8. Rv582 –  
Bergen, lane 1, 50 km/h**

**Pavement 35: Sealastic8. Rv582 –  
Bergen, lane 2, 50 km/h**

2008:

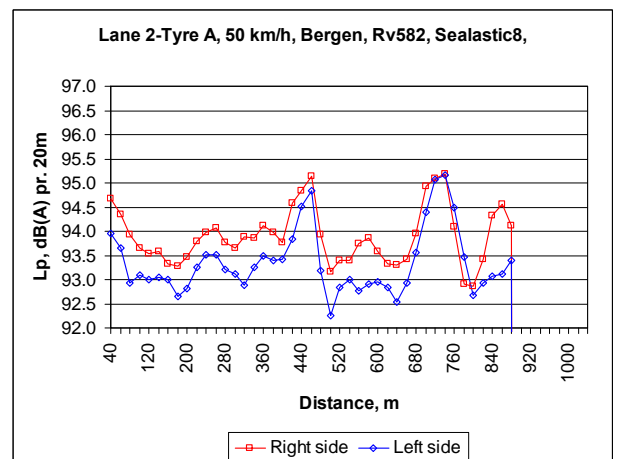
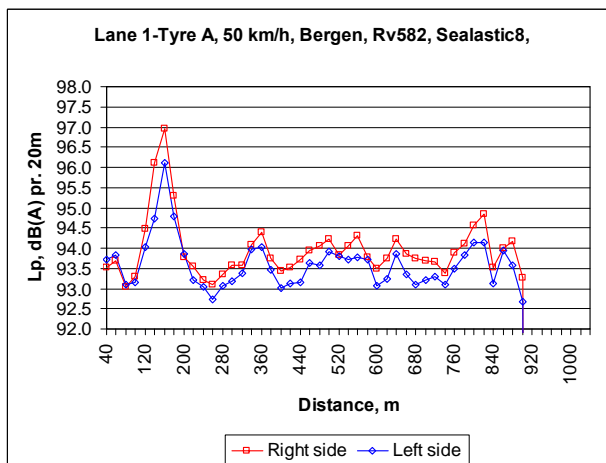
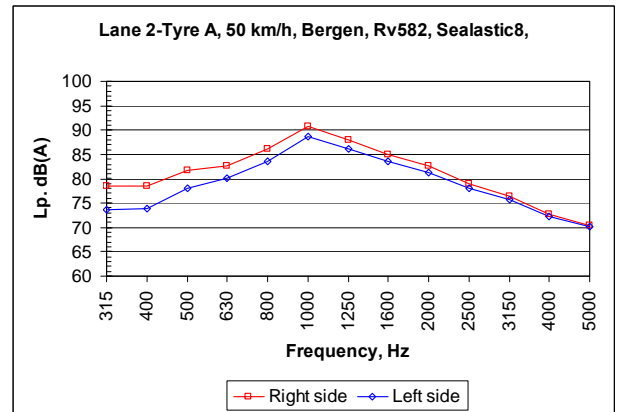
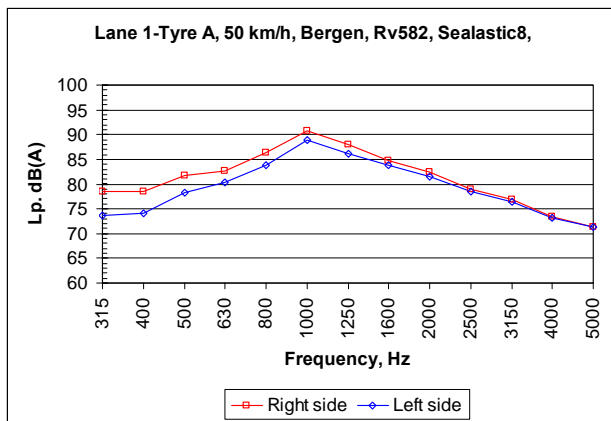
Location	Bergen, Rv582	
Road surface type	Sealastic8	
Test section length	880	
Direction	Lane 1	
Date	8.07.2008	
Air temperature		20
Road temperature		20

2008:

Location	Bergen, Rv582	
Road surface type	Sealastic8	
Test section length	900	
Direction	Lane 2	
Date	8.07.2008	
Air temperature		20
Road temperature		20

Lane 1-Tyre A, 50 km/h, Bergen, Rv582, Sealastic8,					
Total-average speed for dist. 0 - 900 m		49.7		km/h	
Std.dev.		2.85			
dBA / Distance	Air temp	20	Temp.corr. to +20C		
	Right s	Left s	Right side	Left side	
Total-average for dist. 0 - 900 m					
	93.9	93.6	93.9	93.6	
Average for dist. 40 - 920 m					
			93.9	93.6	
Std.dev.					
			0.73	0.61	

Lane 2-Tyre A, 50 km/h, Bergen, Rv582, Sealastic8,					
Total-average speed for dist. 0 - 880 m		49.4		km/h	
Std.dev.		2.68			
dBA / Distance	Air temp	20	Temp.corr. to +20C		
	Right s	Left s	Right side	Left side	
Total-average for dist. 0 - 880 m					
	93.9	93.4	93.9	93.4	
Average for dist. 40 - 900 m					
			93.9	93.3	
Std.dev.					
			0.58	0.67	



**Pavement 36: Da11/Da16. E6 – Horg, lane 1, 50 km/h**

**Pavement 36: Da11/Da16. E6 – Horg, lane 1, 80 km/h**

2008:

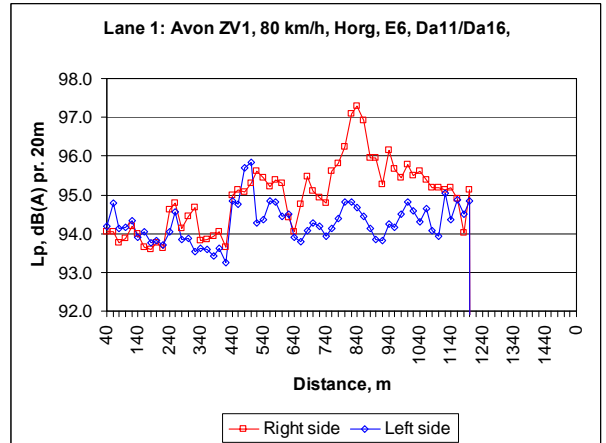
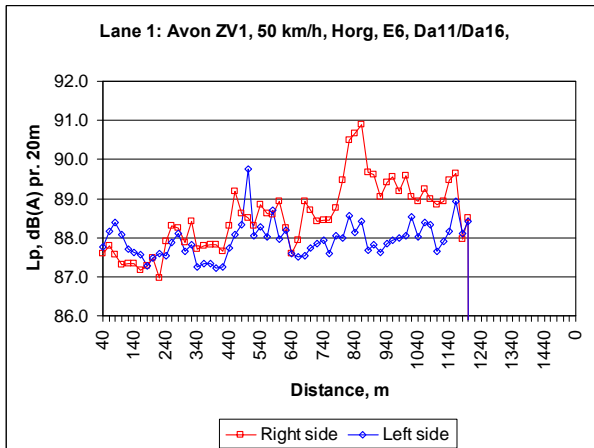
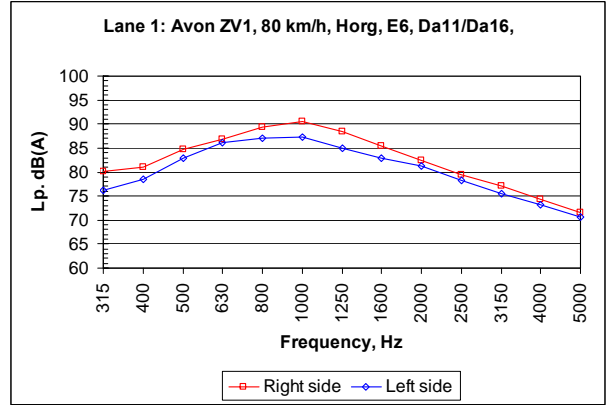
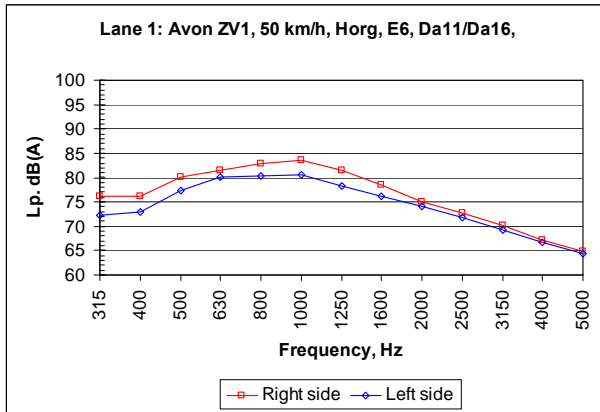
Location	Horg, E6	
Road surface type	Da11/Da16	
Test section length	1200	
Direction	Lane 1	
Date	08.09.2008	
Air temperature		21
Road temperature		24

2008:

Location	Horg, E6	
Road surface type	Da11/Da16	
Test section length	1200	
Direction	Lane 1	
Date	08.09.2008	
Air temperature		21
Road temperature		24

Lane 1: Avon ZV1, 50 km/h, Horg, E6, Da11/Da16,				
Total-average speed for dist. 0 - 1200 m		50.4 km/h		
Std.dev.		0.68		
dBA / Distance	Air temp	21	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 1200 m				
	88.5	87.9	88.5	88.0
Average for dist. 40 - 1220 m				
	88.5	87.9	88.5	87.9
Std.dev.				
	0.88	0.45		

Lane 1: Avon ZV1, 80 km/h, Horg, E6, Da11/Da16,				
Total-average speed for dist. 0 - 1200 m		80.7 km/h		
Std.dev.		0.72		
dBA / Distance	Air temp	21	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 1200 m				
	94.9	94.2	94.9	94.3
Average for dist. 40 - 1220 m				
	94.9	94.3	94.9	94.3
Std.dev.				
	0.89	0.51		

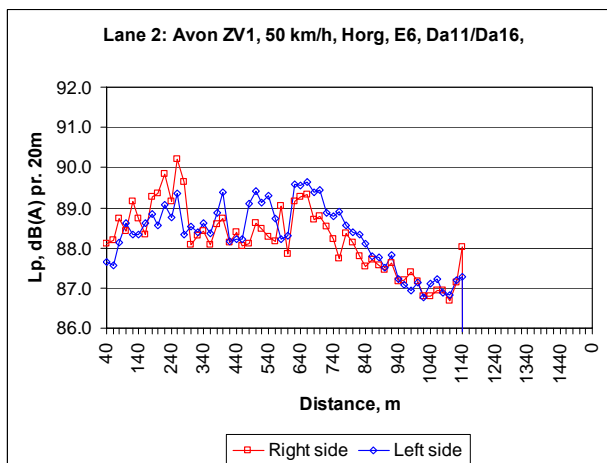
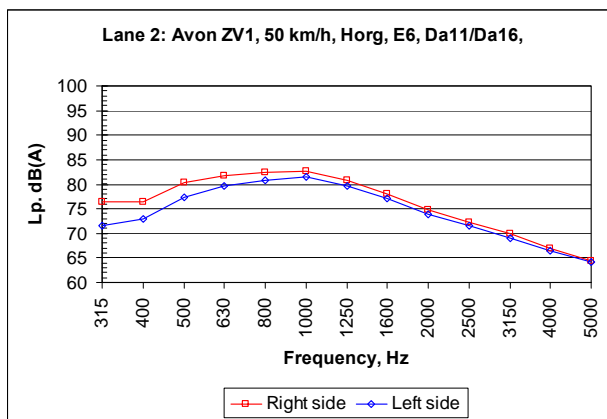


**Pavement 36: Da11/Da16. E6 –  
Horg, lane 2, 50 km/h**

2008:

Location	Horg, E6
Road surface type	Da11/Da16
Test section length	1140
Direction	Lane 2
Date	08.09.2008
Air temperature	21
Road temperature	24

Lane 2: Avon ZV1, 50 km/h, Horg, E6, Da11/Da16,				
Total-average speed for dist. 0 - 1140 m		50.2 km/h		
Std.dev.		0.57		
dBA / Distance	Air temp	21	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 1140 m			
	88.2	88.3	88.2	88.3
Average	for dist. 40 - 1160 m			
Std.dev.	0.81	0.81	0.81	0.81

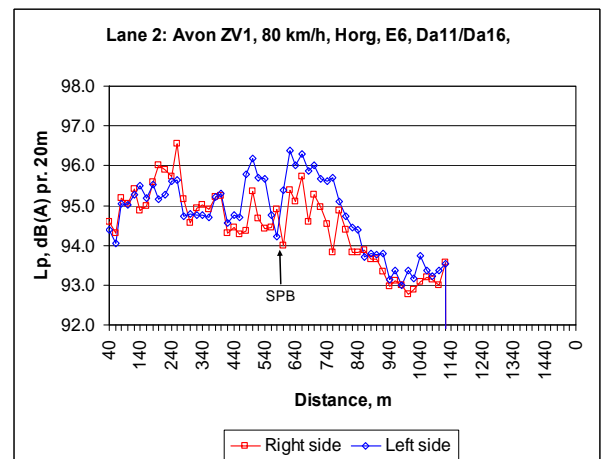
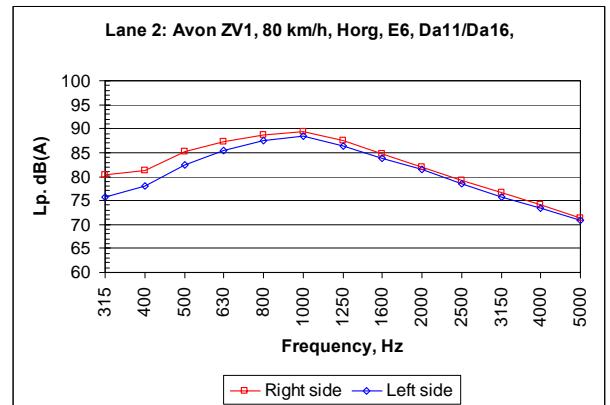


**Pavement 36: Da11/Da16. E6 –  
Horg, lane 2, 80 km/h**

2008:

Location	Horg, E6
Road surface type	Da11/Da16
Test section length	1120
Direction	Lane 2
Date	08.09.2008
Air temperature	21
Road temperature	24

Lane 2: Avon ZV1, 80 km/h, Horg, E6, Da11/Da16,				
Total-average speed for dist. 0 - 1120 m		80.3 km/h		
Std.dev.		0.61		
dBA / Distance	Air temp	21	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average	for dist. 0 - 1120 m			
	94.4	94.7	94.5	94.8
Average	for dist. 40 - 1140 m			
Std.dev.	0.92	0.94	0.92	0.94

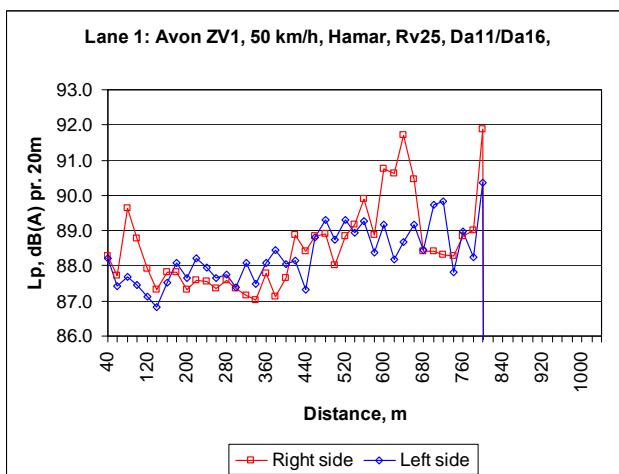
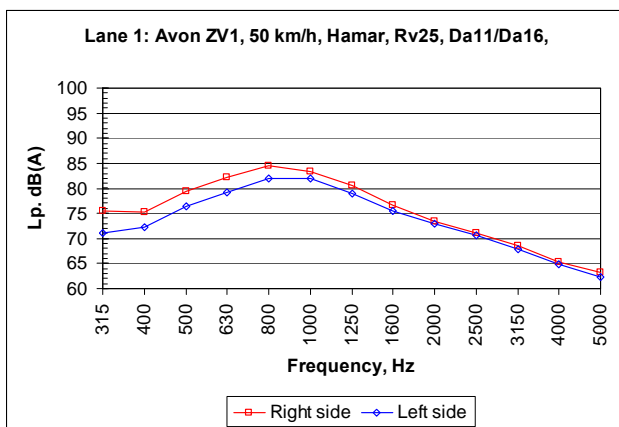


**Pavement 37: Da11/Da16. Rv25 – Hamar, lane 1, 50 km/h**

2008:

Location	Hamar, Rv25
Road surface type	Da11/Da16
Test section length	800
Direction	Lane 1
Date	18.09.2008
Air temperature	13
Road temperature	15

Lane 1: Avon ZV1, 50 km/h, Hamar, Rv25, Da11/Da16,				
Total-average speed for dist. 0 - 800 m		50.0 km/h		
Std.dev.		0.24		
dBA / Distance	Air temp	13	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 800 m				
	89.0	88.7	88.5	88.3
Average for dist. 40 - 820 m				
			88.5	88.3
Std.dev.		1.23 0.81		

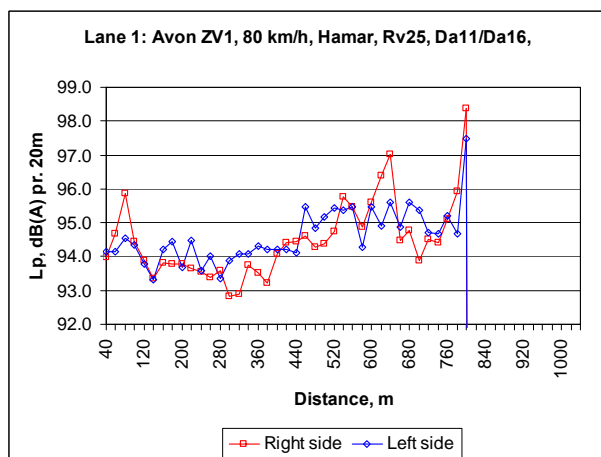
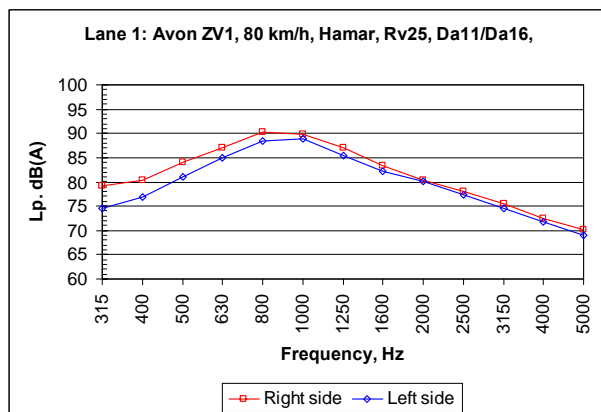


**Pavement 37: Da11/Da16. Rv25 – Hamar, lane 1, 80 km/h**

2008:

Location	Hamar, Rv25
Road surface type	Da11/Da16
Test section length	780
Direction	Lane 1
Date	18.09.2008
Air temperature	13
Road temperature	15

Lane 1: Avon ZV1, 80 km/h, Hamar, Rv25, Da11/Da16,				
Total-average speed for dist. 0 - 800 m		80.6 km/h		
Std.dev.		0.22		
dBA / Distance	Air temp	13	Temp.corr. to +20C	
	Right s	Left s	Right side	Left side
Total-average for dist. 0 - 800 m				
	94.9	95.0	94.5	94.6
Average for dist. 40 - 820 m				
			94.5	94.6
Std.dev.		1.14 0.80		



**Pavement 37: Da11/Da16. Rv25 – Hamar, lane 2, 50 km/h**

**Pavement 37: Da11/Da16. Rv25 – Hamar, lane 2, 80 km/h**

2008:

Location	Hamar, Rv25
Road surface type	Da11/Da16
Test section length	800
Direction	Lane 2
Date	18.09.2008
Air temperature	13
Road temperature	15

2008:

Location	Hamar, Rv25
Road surface type	Da11/Da16
Test section length	800
Direction	Lane 2
Date	18.09.2008
Air temperature	13
Road temperature	15

Lane 2: Avon ZV1, 50 km/h, Hamar, Rv25, Da11/Da16,					
Total-average speed for dist. 0 - 800 m		49.9 km/h			
Std.dev.		0.17			
dBA / Distance	Air temp	13	Temp.corr. to +20C		
	Right s	Left s	Right side	Left side	
Total-average for dist. 0 - 800 m	89.2		88.8	88.4	
Average for dist. 40 - 820 m			88.8	88.4	
Std.dev.			0.76	0.43	

Lane 2: Avon ZV1, 80 km/h, Hamar, Rv25, Da11/Da16,					
Total-average speed for dist. 0 - 800 m		80.8 km/h			
Std.dev.		0.17			
dBA / Distance	Air temp	13	Temp.corr. to +20C		
	Right s	Left s	Right side	Left side	
Total-average for dist. 0 - 800 m	95.2		94.8	94.8	94.4
Average for dist. 40 - 820 m			94.8	94.3	
Std.dev.			0.92	0.39	

