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COMPARISON OF SPECIFIC VALUES OF NOISE EMISSION CAUSED BY ROAD, RAILWAY AND COMBINED CARGO TRANSPORT PROCESS

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Abstract

The aim of this research was the comparison of noise emission of the two continental branches giving the greatest transporting achievement: the road and the railway transporting.

Examinations of noise emission and noise load have been made recently in great numbers on the fields of certain branches, firstly for the determination of the occuring noise and for the establishing of the expected protecting steps.

The aim of the measurements and examinations was the complex evaluation of the noise effects of road and railway cargo transport, taking the transporting achievements into consideration, since only vehicles and vehicle processes have been examined so far.

Not only the fact that railway produces the same transporting achievements with small noise trauma is supposed to be proved but the different road and railway vehicles are analysed, what is more, those vehicles which are consisted of these both, what type of noise load can make.

On the base of the measuring results those types of road and railway vehicles and vehicle combinations have been shown which are appropriate for the smallest noise-load.

Over the evaluation of the present Hungarian situation the results and methods of the comparison can be used well during the development of road-railway combined cargo transport for creating new technological and technical, environmental protecting solutions.

Keywords: Sound Exposure Level, noise emission, comparison of specific noise emission, environmental effects of cargo transport.

1. Introduction

These days beside western countries also in our country there can be no doubt about giving preference to railway cargo transport over the road transportation from the environmental protection's point of view. In these cases analysts practically always take the values of air pollution (consuming of energy) into consideration. However, undeservedly too little is spoken about the comparison of noise emission and noise load of these two sub-branches, although the noise, as pollution, exists in our lives to the highest degree. It is absolutely justified to deal with this question taking the long-term expected traffic increase and its environmental effects into account.

Due to the importance of the task the aim was to compare the degree of noise emission of cargo transport in these two sub-branches. The output, the frequency spectrum, the type in the process of time and the controlling of road and railway noise emission are different. Up to these days the road and railway noise have been compared by both the Hungarian and the international scientific literature on the base of the frequency spectrum, the disturbing effects etc. The comparison of the examined specific noise emission is new, and the summary of the results can be read in the following points.

2. Main Parametres of these Cargo Transport Vehicles

During the comparing process the following marginal conditions are determined:

- At the calculations the cargo transport vehicles are taken into consideration with full use from the points of view both the load capacity and the space and cubic capacity of the cargo hold;
- The incidental noise emitting divergence caused by the difference of transported mass of the vehicles is not taken into account;
- In cases of noise measuring the measure distance is 7.5 m on roads and 25 m on railways. But generally it can be stated that in smaller settlements which have much transit road and railway traffic, these values are reliable. At these places the created protecting distances of both roads and railways are characteristically the same;
- Evaluation of the measurings is made on the base of average transporting parametres and the measured values of noise-emitting.

During the noise measurings at the examined combined and container trains *Table 1* contains the per cent values of the occuring wagon types.

Table 2 contains the average transporting parametres of trucks and cargo trains [1, 2, 3] Internet sources. Types of trucks, goods wagons and containers which occur the most frequently during the cargo transport and their standard parametres can be found in details in reference [4].

Notes to *Table 2*:

- *utilization of trucks in practice $\sim$ it can be calculated with 70%;
- **average transported goods in cargo trains on the base of average numbers of MÁV Zrt. between 1999 – 2003 (5 years);
- In cases of trucks the calculated average values are shown on the base of different makes and types in each mass-category (altogether 82 types):
  - at small trucks ($m < 3.5$ t) the average of 26 types;
  - at medium trucks (3.5 t $< m < 7.5$ t) the average of 21 types;
  - at heavy trucks ($m > 7.5$ t) the average of 35 types;

Table 1. Occuring of Railway Goods Wagons in Cases of the Examined Combined and Container Trains

	Types of railway goods wagons at the measured trains									
	Open metal	Closed metal	Closed wooden	Containers	Flat wagons	Flat wagons with containers	Short sided wagons	Container transporting wagons	Car transporting wagons	Pocket wagons
Their occuring at examined trains [%]	28.4	45.7	2.5	30.9	37.0	12.3	4.9	14.8	6.2	3.7

Table 2. Average Transporting Parameters of Trucks and Cargo Trains

			Average number of wagons [pieces]	Average useful load capacity [t]	Average area of cargo hold [m²]	Average cubic capacity of cargo hold [m³]
Trucks	Small (m < 3.5 t)		–	1.00	4.69	6.65
	Medium (3.5 t < m < 7.5 t)		–	2.85	12.02	29.63
	Heavy (m > 7.5 t)	Semi-trailers	–	24.91 (17.44*)	33.73	92.69
		All	–	16.79	26.51	59.61
Combined cargo and container trains	Mixed load		26.0	1028.9 (942.8**)	1047.7	2115.4
	40 Feet container (1A)			714.0	725.4	1596.4
Ro-La trains (Calculated with tilt trucks)			20.6	494.4	700.4	1891.1

- The average transported parametres of cargo trains are calculated with average number of wagons. The examined trains, *Table 1*, transported goods quantity by MÁV Zrt. cargo trains between 1999 – 2003, and the used wagons were averaged with the same purpose;
- The container trains (consisting of container wagons and/or container transporting flat wagons) were taken into account with average wagon numbers and 40 feet containers. These occur the most frequently;
- The Ro-La trains were calculated with average wagon numbers and tilt trucks. These occur the most frequently.

3. Measuring of Road Transport Noise

Data of measuring places of Road cargo-transporting vehicles can be read in *Table 3*.

Table 3. Data of Roads Noise Measuring Places

<table>
<tr><th colspan="4">Measuring place</th><th colspan="3">Number of measured trucks [pieces]</th></tr>
<tr><th>Class of roads</th><th>Number of roads</th><th>Km segment</th><th>Permitted speed limit [km/h]</th><th>Small trucks (m < 3.5 t)</th><th>Medium trucks (3.5 t < m < 7.5 t)</th><th>Heavy trucks (m > 7.5 t)</th></tr>
<tr><td rowspan="2">I. main road</td><td rowspan="2">4 (E60)</td><td rowspan="2">27</td><td rowspan="2">50</td><td>2</td><td>9</td><td>18</td></tr>
<tr><td colspan="3">29</td></tr>
<tr><td rowspan="2">Motor road</td><td rowspan="2">M0 (E75)</td><td rowspan="2">22</td><td rowspan="2">70</td><td>3</td><td>8</td><td>35</td></tr>
<tr><td colspan="3">46</td></tr>
<tr><td rowspan="2">I. main road</td><td rowspan="2">6 (E73)</td><td rowspan="2">25</td><td rowspan="2">70</td><td>7</td><td>17</td><td>35</td></tr>
<tr><td colspan="3">59</td></tr>
<tr><td colspan="3" rowspan="2"></td><td rowspan="2">Total</td><td>12</td><td>34</td><td>88</td></tr>
<tr><td colspan="3">134</td></tr>
</table>

Measuring of Noise exposure level of passing trucks happened by the given standards. Its summarized results are shown in *Table 4*.

On the base of the measurements the noise emission of road cargo transporting trucks is increasing parellelly with load capacity categories of trucks. It is shown in *Fig. 1*.

Table 4. Average Sound Exposure Level of Passing Trucks

Measuring place	Types of road vehicles		
	Small trucks (m < 3.5 t)	Medium trucks (3.5 t < m < 7.5 t)	Heavy trucks (m > 7.5 t)
	Small and middle-heavy trucks (m < 7.5 t)		
	Average Sound Exposure Level of one passing vehicle, $\overline{L}_{AX}$ [dB(A)]		
I. main road No 4	83.6	82.4	86.7
	82.6		
M0 motor road	79.4	83.7	86.6
	82.9		
I. main road No 6	78.4	82.0	84.4
	81.2		
Average	80.0	82.6	85.9
	84.9		

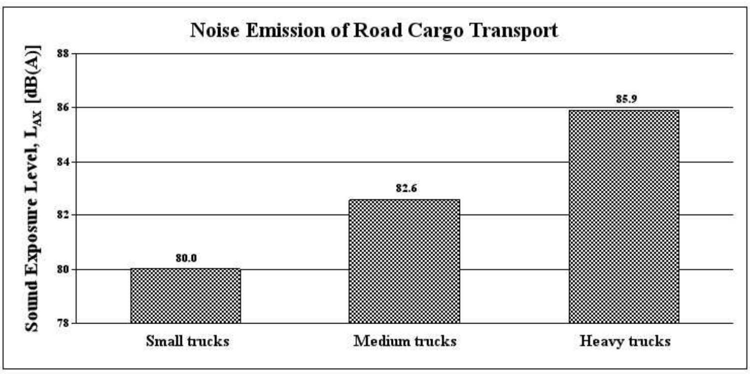

Fig. 1. Noise Emission of Road Cargo Transport by Truck Categories

Table 5. Data of Railway Noise Measuring Places (*on the sector there is a permanent 60 km/h speed limit [3])

<table>
<tr><th rowspan="2">Name of measuring place</th><th colspan="2">Line data</th><th colspan="2">Speed data</th><th colspan="4">Railway data</th><th colspan="3">Number of measured trains [piece]</th></tr>
<tr><th>Line number</th><th>number of TINA corridor</th><th>Permitted highest line speed with locomotive [km/h]</th><th>Speed of cargo trains [km/h]</th><th>Rail system [kg/m]</th><th>Way of rail fastening</th><th>Types of line base</th><th>Thickness of ballast [cm]</th><th>Mixed load</th><th>Ro-La</th><th>Container</th></tr>
<tr><td rowspan="2">Üllő</td><td rowspan="2">100</td><td rowspan="2">IV.</td><td rowspan="2">120</td><td rowspan="2">50…100</td><td rowspan="2">60</td><td rowspan="2">SKL1</td><td rowspan="2">Ferro-concrete base (LW)</td><td rowspan="2">50</td><td>12</td><td>10</td><td>–</td></tr>
<tr><td colspan="3">22</td></tr>
<tr><td rowspan="2">Herceg halom</td><td rowspan="2">1</td><td rowspan="2">IV.</td><td rowspan="2">140</td><td rowspan="2">60…100</td><td rowspan="2">54</td><td rowspan="2">GEO</td><td rowspan="2">Ferro-concrete base (TM)</td><td rowspan="2">40</td><td>16</td><td>2</td><td>6</td></tr>
<tr><td colspan="3">24</td></tr>
<tr><td rowspan="2">Szárliget</td><td rowspan="2">1</td><td rowspan="2">IV.</td><td rowspan="2">140</td><td rowspan="2">60…100</td><td rowspan="2">54</td><td rowspan="2">GEO</td><td rowspan="2">Ferro-concrete base (LM)</td><td rowspan="2">40</td><td>23</td><td>4</td><td>4</td></tr>
<tr><td colspan="3">31</td></tr>
<tr><td rowspan="2">Tura</td><td rowspan="2">80</td><td rowspan="2">V.</td><td rowspan="2">120</td><td rowspan="2">50…100</td><td rowspan="2">54</td><td rowspan="2">SKL2</td><td rowspan="2">Ferro-concrete base (LM)</td><td rowspan="2">50</td><td>9</td><td>–</td><td>–</td></tr>
<tr><td colspan="3">9</td></tr>
<tr><td rowspan="2">Pettend</td><td rowspan="2">30a</td><td rowspan="2">V.</td><td rowspan="2">120</td><td rowspan="2">60…100</td><td rowspan="2">54</td><td rowspan="2">SKL12</td><td rowspan="2">Ferro-concrete base (LM)</td><td rowspan="2">50</td><td>9</td><td>–</td><td>3</td></tr>
<tr><td colspan="3">12</td></tr>
<tr><td rowspan="2">Kiskőrös</td><td rowspan="2">150</td><td rowspan="2">Xb.</td><td rowspan="2">100*</td><td rowspan="2">60…80*</td><td rowspan="2">48</td><td rowspan="2">GEO</td><td rowspan="2">Ferro-concrete base (LM and LX)</td><td rowspan="2">50</td><td>7</td><td>–</td><td>3</td></tr>
<tr><td colspan="3">10</td></tr>
<tr><td colspan="8"></td><td rowspan="2">Total</td><td>76</td><td>16</td><td>16</td></tr>
<tr><td colspan="8"></td><td colspan="3">108</td></tr>
</table>

Category rate of trucks and cargo transporting trailers are shown on the base of average statistics data in the last 5 years (2000 – 2004): small trucks ($m < 3.5$ t) 66%, medium trucks ($3.5 < m < 10.0$ t) and trailers 19%, heavy trucks ($m > 10.0$ t) and trailers 15% [5]. Taking this into consideration it can be stated that from the specific noise emission's point of view the least adventageous small category is the determing (and its rate has been increasing for years). The most adventageous heavy category has the lowest piece numbers. From the frequency of noise emission's point of view, however, the low-pitch frequency of heavy trucks is more disturbing. At the same time it can be reduced with more difficulties, in many cases it practically cannot be.

4. Measuring of Railway Transport Noise

Data of measuring places of cargo trains can be read in *Table 5, 6, 7*. The examined lines are the parts of the international stem-system. In each measuring scene there are electric traction way, chad ballast and the superstructure system is jointless.

Measuring of Sound Exposure Level of the passing cargo trains was made by the rules of standard. Summarized measuring results can be read in *Table 6*.

Table 6. Average Sound Exposure Level of Passing Cargo Trains

Measuring place	Types of cargo trains			
	Cargo trains with mixed wagons and container transporting trains	Ro-La trains	Container transporting trains	Average
	Average Sound Exposure Level of one passing train, $\overline{L}_{AX}$ [dB(A)]			
Üllő	96.2	98.8	–	97.5
Herceghalom	96.0	89.0	95.2	95.3
Szárliget	101.0	94.4	99.5	100.6
Tura	100.0	–	–	100.0
Pettend	99.6	–	101.9	99.6
Kiskőrös	99.3	–	100.8	99.3
Average	99.2	97.4	99.3	99.0

5. Comparison of Noise Emission Quantity during Road and Railway Cargo Transport Projecting on Goods-Tons, Loading Area and Loading Capacity

Noise emission among the characteristic noise parametres of trucks and cargo trains can be taken into account and compared on the base of average L_{AX} values. Average

L_{AX}values of passing trucks in *Table 4*, the values of cargo trains in *Table 6* and main parametres of cargo transporting vehicles in both trafficking sub-branches in *Table 2* can be found. With the help of these values and data the specific Sound Exposure Level in different cargo transporting parametres should be calculated by the followings:

Sound Exposure Level (L_{AX1t}) calculated on 1 goods-ton is the following:

$$L_{AX1t} = \overline{L}_{AX} - 10 \cdot \lg \frac{Q}{Q_0} \text{ dB(A)} \quad (1)$$

where:

- $\overline{L}_{AX}$ average Sound Exposure Level of one passing vehicle [dB(A)];
- Q: average useful loadability of trucks and cargo trains [t];
- Q_0 = 1 t.

Sound Exposure Level ($L_{AX1m}{}^2$) calculated on 1 m^2 of cargo hold is the following:

$$L_{AX1m^2} = \overline{L}_{AX} - 10 \cdot \lg \frac{T}{T_0} \text{ dB(A)} \quad (2)$$

where:

- T: area of average cargo hold of trucks and cargo trains [m^2];
- T_0 = 1 m^2.

Sound Exposure Level ($L_{AX1m}{}^3$) calculated on 1 m^3 of cargo hold is the following:

$$L_{AX1m^3} = \overline{L}_{AX} - 10 \cdot \lg \frac{V}{V_0} \text{ dB(A)} \quad (3)$$

where:

- V: cubic capacity of average cargo hold of trucks and cargo trains [m^3];
- V_0 = 1 m^3.

In the next *Table 7* the specific noise emission values calculated with (1), (2) and (3) formulas can be read.

Conclusions on the base of results given in *Table 7*:

1. Within the road cargo transport comparing the specific noise emission of small, medium and heavy trucks the results can be read in *Table 8*. The degree of human perception of acoustic practice are indicated under the numbers. Small trucks comparing by medium ones produce by $\Delta L_{AX} \approx 2.6$ dB(A) more, comparing with heavy ones by $\Delta L_{AX} \approx 4.3$ dB(A) more specific noise emission. Medium trucks comparing with heavy ones produce with $\Delta L_{AX} \approx 2.0$ dB(A) more specific noise emission. The more advantageous the noise emission of road cargo transport is, the bigger loadability, loading area and loading cubic capacity the vehicle has. At the same time, however, other environmental harm is increasing.

Table 7. Specific Noise Emission of Trucks and Cargo Trains

Cargo transporting vehicle		1 t useful loading [dB(A)]	1 m^2 useful loading area [dB(A)]	1 m^3 cubic capacity of useful loading area [dB(A)]
Trucks	Small (m < 3.5 t)	80.0	73.3	71.8
	Medium (3.5 t < m < 7.5 t)	78.1	71.8	67.9
	Heavy (m > 7.5 t)	73.6	71.7	68.1
Cargo trains		69.1	69.0	65.9

2. Comparison of specific noise emission of road and railway cargo transport can be seen in *Table 9*.

Table 8. Comparison of Specific Noise Emission of Road Cargo Transport

	Difference in case of 1 t useful loading [dB(A)]	Difference in case of 1 m^2 useful loading area [dB(A)]	Difference in case of 1 m^3 cubic capacity of useful loading area [dB(A)]	Average [dB(A)]
Specific noise emission difference between small trucks and middle-heavy trucks	1.9 A little perceptible	1.5 A little perceptible	3.9 Perceptible	2.6 Perceptible
Specific noise emission difference between middle-heavy trucks and heavy trucks	4.4 Perceptible	0.1 Negligible	-0.3 Negligible	2.0 A little perceptible
Specific noise emission difference between small trucks and heavy trucks	6.4 More perceptible	1.6 A little perceptible	3.6 Perceptible	4.3 Perceptible

Small trucks produce on average by $\Delta L_{AX} \approx 8.0$ dB(A) more, middle-heavy trucks produce on average by $\Delta L_{AX} \approx 5.8$ dB(A) more and heavy trucks produce on average by $\Delta L_{AX} \approx 3.3$ dB(A) more specific noise emission than railway cargo transport does. The noise emission of road cargo transport is specifically bigger by $\Delta L_{AX} \approx 6.0$ dB(A). This means that it has three times bigger noise output than the railway cargo transport. It is much more perceptible noise load difference.

Specific noise emission of trucks and cargo trains are shown in *Fig. 2*.

The most frequent ways of transporting are semi-trailers and combined cargo trains. That is why in this case the comparison is also made on the base of practical transporting values, which is the transported useful load. Summary of data which are necessary to the comparison of noise emission is contained in *Table 10* (Transporting parametres in *Table 2*, Sound Exposure Level of passing vehicles in *Tables 4* and *6* can be found). On roads N passing heavy trucks' (semi-trailers) average Sound

Table 9. Comparison of Specific Noise Emission of Road and Railway Cargo Transport

	Difference at 1 t useful loading [dB(A)]	Difference at 1 m^2 useful loading area [dB(A)]	Difference at 1 m^3 cubic capacity of useful loading area [dB(A)]	Average [dB(A)]
Comparison of specific noise emission between small trucks and railway cargo transport	10.9 Fully perceptible	4.3 Perceptible	5.8 More perceptible	8.0 A little perceptible
Comparison of specific noise emission between middle-heavy trucks and railway cargo transport	9.0 Fully perceptible	2.8 Perceptible	1.9 A little perceptible	5.8 More perceptible
Comparison of specific noise emission between heavy trucks and railway cargo transport	4.6 Perceptible	2.7 Perceptible	2.2 A little perceptible	3.3 Perceptible

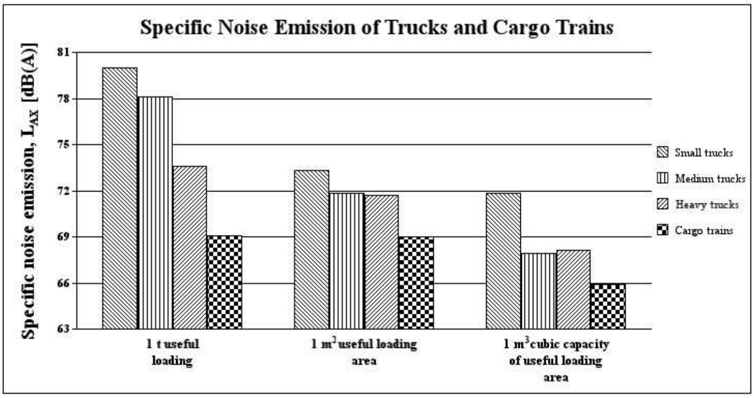

Fig. 2. Specific Noise Emission of Trucks and Cargo Trains

Exposure Level (L_{AX}):

$$\overline{L}_{AXN} = \overline{L}_{AX} + 10 \cdot \lg N \text{ dB(A)} \tag{4}$$

where:

- N is the number of trucks [pieces].

On the base of practical values semi-trailers, transporting piece-goods, produce on average $\Delta L_{AX} \approx 4.0$ dB(A) more specific noise emission than the combined cargo trains. It is a perceptible difference.

Table 10. Comparison of Specific Noise Emission of Semi-trailers and Combined Cargo Trains transporting piece-goods on the base of the Transported Useful Load

	Transported useful load in practice [t]	Average Sound Exposure Level of one passing vehicle, $\overline{L}_{AX}$ [dB(A)]	Number of vehicles [pieces]	Specific noise emission [dB(A)]	Difference [dB(A)]	
Semi-trailers transporting piece-goods	17.44	85.9	54	103.2	4.0	Perceptible
Combined cargo trains	942.8	99.2	1	99.2		

6. Comparison of Noise Emission during the Combined and Road Cargo Transport

Among the combined cargo transporting possibilities the most frequent Ro-La and containers' transporting were examined.

Marginal conditions of comparison of Ro-La and road cargo transporting:

- The noise emission made by Ro-La direct trains' average noise and the total noise emission of heavy trucks transported by trains (per pieces) are compared;
- Ro-La direct trains carry ≈ 21 pieces of heavy trucks on average (*Table 2*);
- The average Sound Exposure Level of passing Ro-La trains is $L_{AXRo-La}$ = 97.4 dB(A) (*Table 6*);
- The average Sound Exposure Level of passing heavy trucks is $L_{AXtruck}$ = 85.9 dB(A) (*Table 4*);
- The calculation of the value of Sound Exposure Level (L_{AX}) of N passing heavy trucks (semi-trailers) was made with the help of formula (4);
- The all transported mass means 21·24.0 t = 504.0 t, as useful load (*Table 2*).

Comparing evaluation of noise emission is shown in *Table 11*.

Table 11. Comparing of Specific Noise Emission of Road and Ro-La Cargo Transport

	Number of wagons on average [pieces]	Average Sound Exposure Level of one passing vehicle, $\overline{L}_{AX}$ [dB(A)]	Number of vehicles [pieces]	Specific noise emission [dB(A)]	Difference [dB(A)]	
Heavy trucks (semi-trailers)	–	85.9	21	99.1	1.7	A little perceptible
Ro-La trains	21	97.4	–	97.4		

On the base of the comparison the road cargo transport is bigger by $\Delta L_{AX} \approx$ 1.5 dB(A). It is slightly higher from the 'A' Sound Pressure Level's point of view than the railway Ro-La transport. The difference is slightly perceptible.

Marginal conditions of the comparison of road and railway container transporting:

- The average noise caused by container trains and the containers being on them (per pieces) and the noise emission in case of transporting heavy trucks are compared;
- Container trains consist of container wagons and flat wagons (e.g. the usually used normal flat wagons signed by K, L and R at MÁV Zrt.). Standard containers can be put on the flat wagons. Different sizes and pieces of containers can be transported on these wagons, suitably for the expectations (e.g. 1 piece of 40 feet, 2 pieces of 20 feet);
- In the case of railway container transporting on the base of the examination 1 piece of container is usually transported per wagons, which is a 40 feet container in most cases;
- In the case of road cargo transport also both types of containers (40 and 20 feet) can be transported by special, in certain types of self-putting, container-transporting trucks;
- During the examination of heavy trucks the type which carries a 40 feet container, was measured too. But at the comparison the average Sound Exposure Level is taken into consideration due to the bigger number of measured pieces (From the Sound Exposure Level's point of view there was no difference between the average of container transporting and other types of heavy trucks);
- The container trains carry $\approx$ 26 pieces of 40 feet containers on average (*Table 2*);
- The average Sound Exposure Level of passing container trains is $L_{AXcontainer}$ = 99.3 dB(A) (*Table 6*);
- The average Sound Exposure Level of passing heavy trucks (semi-trailers) is $L_{AXtruck}$ = 85.9 dB(A) (*Table 4*);
- The average Sound Exposure Level's value (L_{AX}) of N pieces of heavy trucks passing on roads was determined by formula (4);
- The all transported mass means $26{\cdot}27.46t = 714.0t$, as useful cargo (*Table 2*).

Comparing evaluation of noise emission can be found in *Table 12*.

On the base of the comparison the road container-transporting is bigger by $\Delta L_{AX} \approx 1.0$ dB(A) from the 'A' Sound Pressure Level's point of view than the railway container transport. It is slightly perceptible, practically it is negligible.

The results of the comparison is shown in *Fig. 3*.

Table 12. Comparison of Specific Noise Emission of Road and Railway Container Transporting

	Number of wagons on average [pieces]	Average Sound Exposure Level of one passing vehicle, $\overline{L}_{AX}$ [dB(A)]	Number of vehicles [pieces]	Specific noise emission [dB(A)]	Difference [dB(A)]	
Heavy trucks (semi-trailers)	–	85.9	26	100.0	0.7	Negligible
Container trains	26	99.3	–	99.3		

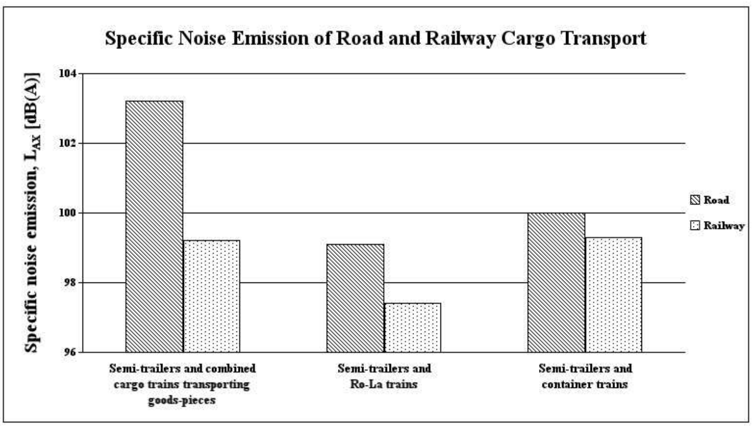

Fig. 3. Specific Noise Emission of Road and Railway Cargo Transport

7. Summary

The basic aim of the examinations is to compare the noise emission of road and railway cargo transport. These examinations were made on the base of on-the-spot measurements.

It can be seen from the data that the noise emission of road cargo transport is increasing parallelly with the load capacity of trucks.

The specific noise emission can be calculated concerning with the useful loadibility, the loading area and the loading cubic capacity of the vehicles. The average values of these three factors show that small trucks produce by $\Delta L_{AX} \approx$ 8.0 dB(A) more average specific noise emission, the medium trucks produce by $\Delta L_{AX} \approx$ 5.8 dB(A) more average specific noise emission and the heavy trucks produce by $\Delta L_{AX} \approx$ 3.3 dB(A) more average specific noise emission than the railway cargo transport does. The road cargo transport produces by $\Delta L_{AX} \approx$ 6.0 dB(A) more average specific noise emission – it is three times bigger noise output – than the railway cargo transport.

The comparison of three other transporting ways, wich often appear in practice, was an extra examination. It was the comparison of semi-trailers with combined, Ro-La and container cargo trains:

- On the base of the practical values it is shown that semi-trailers, transporting piece-goods, produce by $\Delta L_{AX} \approx$ 4.0 dB(A) more average specific noise emission than combined cargo trains;
- The road cargo transport is bigger by $\Delta L_{AX} \approx$ 1.5 dB(A) from the 'A' Sound Pressure Level's point of view than the railway Ro-La transport;
- The road container transport is bigger by $\Delta L_{AX} \approx$ 1.0 dB(A) from the 'A' Sound Pressure Level's point of view than the railway container transport.

All countries in the world are forced to limit the harmful effects of road cargo transport because of self-protection and because of reducing the environmental effects. Experts have to systematize those solutions – even new ones have to be worked out – with which the environmental effects result more bearable life. This work wishes to give some help for this activity with the comparison of specific noise emission caused by road and railway cargo transport.

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