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### ECONOMIC COMMISSION FOR EUROPE

### INLAND TRANSPORT COMMITTEE

Working Party on Rail Transport  
(Fifty-sixth session, 16-18 October 2002,  
agenda item 14)

### PRODUCTIVITY IN RAIL TRANSPORT

Transmitted by the Organization for Co-operation Between Railways (OSZhD)

Note: At its fifty-fourth session in 2000, the Working Party asked the representative of the International Union of Railways (UIC) to provide data from its member railways, and the representative of OSZhD to provide information from its member states that were not UIC members, on the following criteria (TRANS/SC.2/194, para. 23) in 2000,

(a) Labour productivity: (distinguishing between high-speed and conventional rail transport)

employees/km of network in use  
net ton-km + passenger-km employee.

(b) Productivity of freight transport:

per km: gross ton-km/km of network  
net ton-km/km of network  
per employee: gross ton-km/employee  
net ton-km/employee.

(c) Productivity of passenger transport: (distinguishing between high-speed and conventional rail transport)

|               |                            |
|---------------|----------------------------|
| per km:       | passenger-km/km of network |
| per employee: | passenger-km/employee      |

(d) Productivity of traffic: (distinguishing between high-speed and conventional rail transport)

net ton-km + passenger-km/km of network

(e) Productivity of locomotives: (distinguishing between high-speed and conventional rail transport)

gross ton-km/locomotive

(f) Productivity of wagons:  
net ton-km/wagon

(g) Productivity of lines: (where necessary only on railway lines to be determined)

passenger train-km + freight train-km /km of network

(h) Energy consumption (for traction power):

MJ/1000 gross ton-km.

The Working Party may wish to consider the reply received from OSZhD, which is reproduced below.

\* \* \*

**Railway productivity indicators for 1999****(a) Labour productivity:**

| Country      | Railway | Length<br>of<br>Net. | Number<br>of<br>Employ. | net<br>tkm | pkm    | tkm+<br>pkm | productivity |            |                        |             |
|--------------|---------|----------------------|-------------------------|------------|--------|-------------|--------------|------------|------------------------|-------------|
|              |         |                      |                         |            |        |             | empl/<br>km  | +,-<br>98. | (tkm+pkm)/<br>employee | +,-<br>98r. |
|              |         | Km                   |                         | Mil.       | Mil.   | Mil.        |              | %          | Mil.                   | %           |
| Azerbaijan   | AZ      | 2116                 | 23387                   | 5225       | 422    | 5647        | <b>11.05</b> | -7.59      | <b>0.241</b>           | +16.79      |
| Belarus      | BC      | 5523                 | 69972                   | 30529      | 16874  | 64277       | <b>12.67</b> | +0.52      | <b>0.919</b>           | +12.53      |
| Bulgaria     | BDZ     | 4290                 | 40915                   | 5297       | 3819   | 9116        | <b>9.54</b>  | -1.40      | <b>0.223</b>           | -15.11      |
| Hungary      | MAV     | 7769                 | 48879                   | 7444       | 6699   | 14143       | <b>6.29</b>  | -2.12      | <b>0.289</b>           | -0.42       |
| Vietnam      | DSVN    | 2632                 | 29577                   | 1398       | 2721   | 4119        | <b>11.24</b> | -2.27      | <b>0.139</b>           | +9.02       |
| Georgia      | GR      | 1545                 | 14844                   | 3161       | 355    | 3516        | <b>9.61</b>  | -1.57      | <b>0.237</b>           | +22.61      |
| Iran         | RAI     | 6398                 | 18309                   | 14082      | 6451   | 20533       | <b>2.86</b>  | -11.58     | <b>1.121</b>           | +79.44      |
| Kazakhstan   | KZH     | 13601                | 122469                  | 91700      | 8859   | 100559      | <b>9.00</b>  | -15.31     | <b>0.821</b>           | +7.73       |
| China        | CSR     | 57923                | 1567000                 | 1257789    | 404627 | 1662416     | <b>27.05</b> | -4.76      | <b>1.061</b>           | +8.78       |
| PDR Korea    | ZC      | 4400                 | ...                     | ...        | ...    | ...         | ...          | ...        | ...                    | ...         |
| Kyrgyzstan   | KRG     | 417                  | 3929                    | 355        | 31     | 386         | <b>9.42</b>  | -12.16     | <b>0.098</b>           | -15.70      |
| Latvia       | LDZ     | 2413                 | 15059                   | 12210      | 984    | 13194       | <b>6.24</b>  | -1.36      | <b>0.876</b>           | -4.83       |
| Lithuania    | LG      | 1905                 | 13685                   | 7849       | 745    | 8594        | <b>7.18</b>  | +0.36      | <b>0.628</b>           | +0.02       |
| Moldova      | CFM     | 1140                 | 11514                   | 1232       | 343    | 1575        | <b>10.10</b> | -17.06     | <b>0.137</b>           | -38.56      |
| Mongolia     | MTZ     | 1810                 | 7261                    | 3515       | 1013   | 4528        | <b>4.01</b>  | +5.34      | <b>0.624</b>           | +11.97      |
| Poland       | PKP     | 22891                | 199410                  | 55482      | 21518  | 77000       | <b>8.71</b>  | -4.90      | <b>0.386</b>           | -0.28       |
| Russian F.   | RZD     | 86031                | 1236700                 | 1088270    | 109669 | 1307608     | <b>14.38</b> | -2.80      | <b>1.057</b>           | +22.89      |
| Romania      | CFR     | 11463                | 97893                   | 14680      | 12304  | 26984       | <b>8.54</b>  | +2.56      | <b>0.276</b>           | -16.13      |
| Slovakia     | ZSR     | 3662                 | 44642                   | 9914       | 2968   | 12882       | <b>12.19</b> | -2.78      | <b>0.289</b>           | -10.76      |
| Tajikistan   | TDZ     | 547                  | 4036                    | 1282       | 61     | 1343        | <b>7.38</b>  | +0.25      | <b>0.333</b>           | -15.16      |
| Turkmenistan | TRK     | 2446                 | 15176                   | 7337       | 701    | 8038        | <b>6.20</b>  | -6.22      | <b>0.530</b>           | +0.19       |
| Uzbekistan   | UTI     | 3645                 | 29406                   | 13883      | 1898   | 15781       | <b>8.07</b>  | -11.65     | <b>0.537</b>           | -0.11       |
| Ukraine      | UZ      | 22473                | 303418                  | 156336     | 47600  | 251536      | <b>13.50</b> | -1.53      | <b>0.829</b>           | -1.05       |
| Czech R.     | CD      | 9365                 | 88069                   | 16464      | 6929   | 23393       | <b>9.40</b>  | -1.75      | <b>0.266</b>           | -5.22       |
| Estonia      | EVR     | 968                  | 5860                    | 7020       | 238    | 7258        | <b>6.05</b>  | -3.21      | <b>1.239</b>           | +24.27      |

**(b) Productivity of freight transport:**

| Country      | Railway | Length of<br>network | Number<br>of employ. | Gross<br>tkm | Net<br>tkm | Per km of network |          |               |          | Per employee |          |              |          |
|--------------|---------|----------------------|----------------------|--------------|------------|-------------------|----------|---------------|----------|--------------|----------|--------------|----------|
|              |         |                      |                      |              |            | gross tkm         | +,- 98r. | net tkm       | +,- 98r. | gross tkm    | +,- 98r. | net tkm      | +,- 98r. |
|              |         | Km                   |                      | Mil.         | Mil.       | Mil.              | %        | Mil.          | %        | Mil.         | %        | Mil.         | %        |
| Azerbaijan   | AZ      | 2116                 | 23387                | 9854         | 5225       | <b>4.657</b>      | +4.62    | <b>2.469</b>  | +11.18   | <b>0.421</b> | +13.22   | <b>0.223</b> | +20.31   |
| Belarus      | BC      | 5523                 | 69972                | 56736        | 30529      | <b>10.273</b>     | -0.22    | <b>5.528</b>  | +0.67    | <b>0.811</b> | -0.73    | <b>0.436</b> | +0.15    |
| Bulgaria     | BDZ     | 4290                 | 40915                | 9201         | 5297       | <b>2.145</b>      | -11.53   | <b>1.235</b>  | -13.90   | <b>0.225</b> | -10.27   | <b>0.129</b> | -12.67   |
| Hungary      | MAV     | 7769                 | 48879                | 15013.4      | 7444       | <b>1.932</b>      | -0.57    | <b>0.958</b>  | -5.20    | <b>0.307</b> | +1.58    | <b>0.152</b> | -3.14    |
| Vietnam      | DSVN    | 2632                 | 29577                | 2880         | 1398       | <b>1.094</b>      | +5.49    | <b>0.531</b>  | +5.59    | <b>0.097</b> | +7.94    | <b>0.047</b> | +8.04    |
| Georgia      | GR      | 1545                 | 14844                | 6093         | 3161       | <b>3.944</b>      | +50.20   | <b>2.046</b>  | +25.22   | <b>0.410</b> | +52.60   | <b>0.213</b> | +27.22   |
| Iran         | RAI     | 6398                 | 18309                | 26124        | 14082      | <b>4.083</b>      | +10.24   | <b>2.201</b>  | +8.81    | <b>1.427</b> | +24.67   | <b>0.769</b> | +23.06   |
| Kazakhstan   | KZH     | 13601                | 122469               | 159544       | 91700      | <b>11.730</b>     | -9.88    | <b>6.742</b>  | -7.91    | <b>1.303</b> | +6.41    | <b>0.749</b> | +8.73    |
| China        | CSR     | 57923                | 1567000              | 2031718      | 1257789    | <b>35.076</b>     | +2.82    | <b>21.715</b> | +1.98    | <b>1.297</b> | +7.96    | <b>0.803</b> | +7.08    |
| PDR Korea    | ZC      | 4400                 | ...                  | ...          | ...        | ...               | ...      | ...           | ...      | ...          | ...      | ...          | ...      |
| Kyrgyzstan   | KRG     | 417                  | 3929                 | 660          | 355        | <b>1.583</b>      | -17.25   | <b>0.851</b>  | -23.36   | <b>0.168</b> | -5.80    | <b>0.090</b> | -12.75   |
| Latvia       | LDZ     | 2413                 | 15059                | 22201        | 12210      | <b>9.201</b>      | -6.51    | <b>5.060</b>  | -6.04    | <b>1.474</b> | -5.23    | <b>0.811</b> | -4.75    |
| Lithuania    | LG      | 1905                 | 13685                | 15211        | 7849       | <b>7.985</b>      | -0.66    | <b>4.120</b>  | -0.40    | <b>1.112</b> | -1.01    | <b>0.574</b> | -0.75    |
| Moldova      | CFM     | 1140                 | 11514                | 2205         | 1232       | <b>1.934</b>      | -49.80   | <b>1.081</b>  | -50.28   | <b>0.192</b> | -39.48   | <b>0.107</b> | -40.06   |
| Mongolia     | MTZ     | 1810                 | 7261                 | 6288         | 3515       | <b>3.474</b>      | +22.29   | <b>1.942</b>  | +23.03   | <b>0.866</b> | +16.09   | <b>0.484</b> | +16.80   |
| Poland       | PKP     | 22891                | 199410               | 116638       | 55482      | <b>5.095</b>      | -7.50    | <b>2.424</b>  | -8.93    | <b>0.585</b> | -2.73    | <b>0.278</b> | -4.24    |
| Russian F.   | RZD     | 86031                | 1236700              | 2104210      | 1088270    | <b>24.459</b>     | +17.74   | <b>12.650</b> | +20.90   | <b>1.701</b> | +21.13   | <b>0.880</b> | +24.38   |
| Romania      | CFR     | 11463                | 97893                | 31967        | 14680      | <b>2.789</b>      | -17.72   | <b>1.281</b>  | -17.67   | <b>0.327</b> | -19.78   | <b>0.150</b> | -19.72   |
| Slovakia     | ZSR     | 3662                 | 44642                | 22956        | 9914       | <b>6.269</b>      | -10.08   | <b>2.707</b>  | -15.53   | <b>0.514</b> | -7.51    | <b>0.222</b> | -13.12   |
| Tajikistan   | TDZ     | 547                  | 4036                 | 2232         | 1282       | <b>4.080</b>      | -12.91   | <b>2.344</b>  | -12.07   | <b>0.553</b> | -13.13   | <b>0.318</b> | -12.29   |
| Turkmenistan | TRK     | 2446                 | 15176                | 13432        | 7337       | <b>5.491</b>      | -7.47    | <b>3.000</b>  | -7.88    | <b>0.885</b> | -1.33    | <b>0.483</b> | -1.77    |
| Uzbekistan   | UTI     | 3645                 | 29406                | 25816        | 13883      | <b>7.083</b>      | -9.46    | <b>3.809</b>  | -11.51   | <b>0.878</b> | +2.48    | <b>0.472</b> | +0.15    |
| Ukraine      | UZ      | 22473                | 303418               | 259190       | 156336     | <b>11.533</b>     | -2.08    | <b>6.957</b>  | -1.32    | <b>0.854</b> | -0.56    | <b>0.515</b> | +0.21    |
| Czech Rep.   | CD      | 9365                 | 88069                | 36849        | 16464      | <b>3.935</b>      | -9.90    | <b>1.758</b>  | -9.38    | <b>0.418</b> | -8.30    | <b>0.187</b> | -7.77    |
| Estonia      | EVR     | 968                  | 5860                 | 12648        | 7020       | <b>13.066</b>     | +21.47   | <b>7.252</b>  | +21.08   | <b>2.158</b> | +25.50   | <b>1.198</b> | +25.10   |

**(c) Productivity of passenger transport and productivity of traffic:**

| Country      | Railway | Length<br>of network | Number<br>of<br>employ. | pkm    | tkm +<br>pkm | Per km of network |          |               |          | Per employee |          |              |          |
|--------------|---------|----------------------|-------------------------|--------|--------------|-------------------|----------|---------------|----------|--------------|----------|--------------|----------|
|              |         |                      |                         |        |              | pkm               | +,- 98r. | tkm +<br>pkm  | +,- 98r. | pkm          | +,- 98r. | tkm +<br>pkm | +,- 98r. |
|              |         | Km                   |                         | Mil.   | Mil.         | Mil.              | %        | Mil.          | %        | Mil.         | %        | Mil.         | %        |
| Azerbaijan   | AZ      | 2116                 | 23387                   | 422    | 5647         | <b>0.199</b>      | -20.79   | <b>2.669</b>  | +7.92    | <b>0.018</b> | -14.28   | <b>0.241</b> | +16.79   |
| Belarus      | BC      | 5523                 | 69972                   | 16874  | 64277        | <b>3.055</b>      | +27.36   | <b>11.638</b> | +13.12   | <b>0.241</b> | +26.71   | <b>0.919</b> | +12.53   |
| Bulgaria     | BDZ     | 4290                 | 40915                   | 3819   | 9116         | <b>0.890</b>      | -19.43   | <b>2.125</b>  | -16.31   | <b>0.093</b> | -18.28   | <b>0.223</b> | -15.11   |
| Hungary      | MAV     | 7769                 | 48879                   | 6699   | 14143        | <b>0.862</b>      | +0.60    | <b>1.820</b>  | -2.54    | <b>0.137</b> | +2.78    | <b>0.289</b> | -0.42    |
| Vietnam      | DSVN    | 2632                 | 29577                   | 2721   | 4119         | <b>1.034</b>      | +7.04    | <b>1.565</b>  | +6.54    | <b>0.092</b> | +9.52    | <b>0.139</b> | +9.02    |
| Georgia      | GR      | 1545                 | 14844                   | 355    | 3516         | <b>0.230</b>      | -8.79    | <b>2.276</b>  | +20.68   | <b>0.024</b> | -7.33    | <b>0.237</b> | +22.61   |
| Iran         | RAI     | 6398                 | 18309                   | 6451   | 20533        | <b>1.008</b>      | +16.10   | <b>3.209</b>  | +11.00   | <b>0.352</b> | +31.31   | <b>1.121</b> | +25.54   |
| Kazakhstan   | KZH     | 13601                | 122469                  | 8859   | 100559       | <b>0.651</b>      | -16.71   | <b>7.394</b>  | -8.76    | <b>0.072</b> | -1.65    | <b>0.821</b> | +7.73    |
| China        | CSR     | 57923                | 1567000                 | 404627 | 1662416      | <b>6.986</b>      | +8.98    | <b>28.700</b> | +3.60    | <b>0.258</b> | +14.43   | <b>1.061</b> | +8.78    |
| PDR Korea    | ZC      | 4400                 | ...                     | ...    | ...          | ...               | ...      | ...           | ...      | ...          | ...      | ...          | ...      |
| Kyrgyzstan   | KRG     | 417                  | 3929                    | 31     | 386          | <b>0.074</b>      | -46.58   | <b>0.926</b>  | -25.95   | <b>0.008</b> | -39.18   | <b>0.098</b> | -15.70   |
| Latvia       | LDZ     | 2413                 | 15059                   | 984    | 13194        | <b>0.408</b>      | -7.08    | <b>5.468</b>  | -6.12    | <b>0.065</b> | -5.80    | <b>0.876</b> | -4.83    |
| Lithuania    | LG      | 1905                 | 13685                   | 745    | 8594         | <b>0.391</b>      | +9.28    | <b>4.511</b>  | +0.37    | <b>0.054</b> | +8.89    | <b>0.628</b> | +0.02    |
| Moldova      | CFM     | 1140                 | 11514                   | 343    | 1575         | <b>0.301</b>      | -44.04   | <b>1.382</b>  | -49.05   | <b>0.030</b> | -32.53   | <b>0.137</b> | -38.56   |
| Mongolia     | MTZ     | 1810                 | 7261                    | 1013   | 4528         | <b>0.560</b>      | +3.16    | <b>2.502</b>  | +17.95   | <b>0.140</b> | -2.07    | <b>0.624</b> | +11.97   |
| Poland       | PKP     | 22891                | 199410                  | 21518  | 77000        | <b>0.940</b>      | +6.15    | <b>3.364</b>  | -5.17    | <b>0.108</b> | +11.63   | <b>0.386</b> | -0.28    |
| Russian F.   | RZD     | 86031                | 1236700                 | 109669 | 1307608      | <b>1.275</b>      | +12.72   | <b>15.199</b> | +19.45   | <b>0.089</b> | +15.97   | <b>1.057</b> | +22.89   |
| Romania      | CFR     | 11463                | 97893                   | 12304  | 26984        | <b>1.073</b>      | -9.12    | <b>2.354</b>  | -13.98   | <b>0.126</b> | -11.39   | <b>0.276</b> | -16.13   |
| Slovakia     | ZSR     | 3662                 | 44642                   | 2968   | 12882        | <b>0.810</b>      | -4.62    | <b>3.518</b>  | -13.25   | <b>0.066</b> | -1.89    | <b>0.289</b> | -10.76   |
| Tajikistan   | TDZ     | 547                  | 4036                    | 61     | 1343         | <b>0.112</b>      | -49.59   | <b>2.455</b>  | -14.95   | <b>0.015</b> | -49.71   | <b>0.333</b> | -15.16   |
| Turkmenistan | TRK     | 2446                 | 15176                   | 701    | 8038         | <b>0.287</b>      | +18.70   | <b>3.286</b>  | -6.05    | <b>0.046</b> | +26.58   | <b>0.530</b> | +0.19    |
| Uzbekistan   | UTI     | 3645                 | 29406                   | 1898   | 15781        | <b>0.521</b>      | -13.39   | <b>4.329</b>  | -11.74   | <b>0.065</b> | -1.97    | <b>0.537</b> | -0.11    |
| Ukraine      | UZ      | 22473                | 303418                  | 47600  | 251536       | <b>2.118</b>      | -4.52    | <b>11.193</b> | -2.56    | <b>0.157</b> | -3.04    | <b>0.829</b> | -1.05    |
| Czech R.     | CD      | 9365                 | 88069                   | 6929   | 23393        | <b>0.740</b>      | -0.34    | <b>2.498</b>  | -6.88    | <b>0.079</b> | +1.43    | <b>0.266</b> | -5.22    |
| Estonia      | EVR     | 968                  | 5860                    | 238    | 7258         | <b>0.246</b>      | +0.64    | <b>7.498</b>  | +20.28   | <b>0.041</b> | +3.98    | <b>1.239</b> | +24.27   |

**(d) Productivity of locomotives and wagons**

| Country      | Railway | Net<br>tkm | Gross<br>tkm<br>total | Average<br>number of<br>locomotives per year | Average<br>number of wagons per<br>year | Gross<br>tkm/<br>locomotive | +, - 98г. | Net<br>tkm/wagon | +, - 98г. |
|--------------|---------|------------|-----------------------|----------------------------------------------|-----------------------------------------|-----------------------------|-----------|------------------|-----------|
|              |         | Mil.       | Mil.                  | locomotives                                  | wagons                                  | Mil.                        | %         | Mil.             | %         |
| Azerbaijan   | AZ      | 5225       | 11918                 | 515                                          | 26470                                   | <b>23.142</b>               | +2.84     | <b>0.197</b>     | +6.84     |
| Belarus      | BC      | 30529      | 71234                 | ...                                          | ...                                     | ...                         | ...       | ...              | ...       |
| Bulgaria     | BDZ     | 5297       | 16663                 | 697                                          | 32044                                   | <b>23.907</b>               | -6.50     | <b>0.165</b>     | -8.19     |
| Hungary      | MAV     | 7444       | 27872                 | 1075                                         | 24255                                   | <b>25.928</b>               | +2.88     | <b>0.307</b>     | +1.90     |
| Vietnam      | DSVN    | 1398       | 6264                  | 339                                          | 4530                                    | <b>18.478</b>               | +10.59    | <b>0.309</b>     | +6.71     |
| Georgia      | GR      | 3161       | 7232                  | 392                                          | 16422                                   | <b>18.449</b>               | +23.17    | <b>0.192</b>     | +23.48    |
| Iran         | RAI     | 14082      | 33399                 | 559                                          | 17470                                   | <b>59.748</b>               | +11.46    | <b>0.806</b>     | +9.65     |
| Kazakhstan   | KZH     | 91700      | 183826                | 2137                                         | 100023                                  | <b>86.021</b>               | -3.34     | <b>0.917</b>     | -8.21     |
| China        | CSR     | 1257789    | 2425067               | 13374                                        | 434843                                  | <b>181.327</b>              | +4.76     | <b>2.893</b>     | +3.33     |
| PDR Korea    | ZC      | ...        | ...                   | ...                                          | ...                                     | ...                         | ...       | ...              | ...       |
| Kyrgyzstan   | KRG     | 355        | 839                   | 47                                           | 2925                                    | ...                         | ...       | <b>0.121</b>     | -62.12    |
| Latvia       | LDZ     | 12210      | 22974                 | 268                                          | 9569                                    | <b>85.724</b>               | -2.87     | <b>1.276</b>     | +2.66     |
| Lithuania    | LG      | 7849       | 16488                 | 199                                          | 11743                                   | <b>82.854</b>               | +27.21    | <b>0.668</b>     | +4.92     |
| Moldova      | CFM     | 1232       | 3101                  | 96                                           | 12671                                   | <b>32.302</b>               | -38.22    | <b>0.097</b>     | -48.37    |
| Mongolia     | MTZ     | 3515       | 8264                  | 69                                           | 1680                                    | <b>119.768</b>              | +13.83    | <b>2.092</b>     | +19.22    |
| Poland       | PKP     | 55482      | 152403                | 4092                                         | 83586                                   | <b>37.244</b>               | +0.28     | <b>0.664</b>     | -6.08     |
| Russian F.   | RZD     | 1088270    | 2353336               | 15323                                        | 566003                                  | <b>153.582</b>              | +12.78    | <b>1.923</b>     | +26.30    |
| Romania      | CFR     | 14680      | 56618                 | 2891                                         | 141463                                  | <b>19.584</b>               | -15.42    | <b>0.104</b>     | -9.16     |
| Slovakia     | ZSR     | 9914       | 29193                 | 1186                                         | 29941                                   | <b>24.615</b>               | -7.12     | <b>0.331</b>     | -23.40    |
| Tajikistan   | TDZ     | 1282       | 2519                  | 59                                           | 2117                                    | <b>42.695</b>               | -20.45    | <b>0.606</b>     | +18.00    |
| Turkmenistan | TRK     | 7337       | 16906                 | 257                                          | 13224                                   | <b>65.782</b>               | -4.70     | <b>0.555</b>     | -4.91     |
| Uzbekistan   | UTI     | 13883      | 29619                 | 785                                          | 12830                                   | <b>37.731</b>               | -64.57    | <b>1.082</b>     | +0.86     |
| Ukraine      | UZ      | 156336     | 327579                | 4402                                         | 198586                                  | <b>74.416</b>               | +3.53     | <b>0.787</b>     | -0.81     |
| Czech R.     | CD      | 16464      | 49611                 | 2724                                         | 64521                                   | <b>18.213</b>               | -6.51     | <b>0.255</b>     | -2.77     |
| Estonia      | EVR     | 7020       | 12961                 | 112                                          | 6978                                    | <b>115.723</b>              | +19.71    | <b>1.006</b>     | +37.25    |

# **Railway productivity indicators for 2000**

## **(a) Labour productivity:**

| Country      | Railway | Length | Number  | net     | pkm    | tkm+    | productivity |          |              |           |
|--------------|---------|--------|---------|---------|--------|---------|--------------|----------|--------------|-----------|
|              |         | Of     | Of      | tkm     |        | ркм     | empl/ km     | +, - 99. | (tkm+        | +, - 99г. |
|              |         | Net.   | Employ. |         |        |         |              |          | ркм)/        |           |
|              |         | Km     |         | Mil.    | Mil.   | Mil.    |              | %        | Mil.         | %         |
| Azerbaijan   | AZ      | 2116   | 22271   | 5770    | 493    | 6263    | <b>10.5</b>  | -4.77    | <b>0.281</b> | +16.47    |
| Belarus      | BC      | 5512   | 69755   | 31425   | 17722  | 66869   | <b>12.7</b>  | -0.11    | <b>0.959</b> | +4.36     |
| Bulgaria     | BDZ     | 4320   | 35854   | 5538    | 3472   | 9010    | <b>8.3</b>   | -12.98   | <b>0.251</b> | +12.79    |
| Hungary      | MAV     | 7785   | 48014   | 7779    | 6915   | 14694   | <b>6.2</b>   | -1.97    | <b>0.306</b> | +5.77     |
| Vietnam      | DSVN    | 2632   | 30343   | 1901.5  | 3200   | 5101.5  | <b>11.5</b>  | +2.59    | <b>0.168</b> | +20.73    |
| Georgia      | GR      | 1562   | 15817   | 3914    | 453    | 4367    | <b>10.1</b>  | +5.40    | <b>0.276</b> | +16.56    |
| Iran         | RAI     | 6688   | 28091   | 14178.7 | 7119   | 21297.7 | <b>4.2</b>   | +46.77   | <b>0.758</b> | -32.40    |
| Kazakhstan   | KZH     | 13545  | 113001  | 124983  | 10215  | 135198  | <b>8.3</b>   | -7.35    | <b>1.196</b> | +45.71    |
| China        | CSR     | 58656  | 1536591 | 1333606 | 441468 | 1775074 | <b>26.2</b>  | -3.17    | <b>1.155</b> | +8.89     |
| PDR Korea    | ZC      | 4400   | ...     | ...     | ...    | ...     | ...          | ...      | ...          | ...       |
| Kyrgyzstan   | KRG     | 417    | 3947    | 337     | 44     | 381     | <b>9.5</b>   | +0.46    | <b>0.097</b> | -1.75     |
| Latvia       | LDZ     | 2331   | 14119   | 13310   | 715    | 14025   | <b>6.1</b>   | -2.94    | <b>0.993</b> | +13.38    |
| Lithuania    | LG      | 1905   | 13240   | 8918    | 611    | 9529    | <b>7.0</b>   | -3.25    | <b>0.720</b> | +14.61    |
| Moldova      | CFM     | 1139   | 11021   | 1538    | 315    | 1853    | <b>9.7</b>   | -4.20    | <b>0.168</b> | +22.91    |
| Mongolia     | MTZ     | 1810   | 7232    | 4293    | 1070   | 5363    | <b>4.0</b>   | -0.40    | <b>0.742</b> | +18.92    |
| Poland       | PKP     | 22560  | 180763  | 54455   | 19706  | 74161   | <b>8.0</b>   | -8.02    | <b>0.410</b> | +6.25     |
| Russian F.   | RZD     | 86075  | 1294700 | 1197495 | 131920 | 1461335 | <b>15.0</b>  | +4.64    | <b>1.129</b> | +6.75     |
| Romania      | CFR     | 11364  | 95262   | 16431   | 11632  | 28063   | <b>8.4</b>   | -1.84    | <b>0.295</b> | +6.87     |
| Slovakia     | ZSR     | 3662   | 42589   | 11289   | 2870   | 14159   | <b>11.6</b>  | -4.60    | <b>0.332</b> | +15.21    |
| Tajikistan   | TDZ     | 547    | 4036    | 1282    | 61     | 1343    | <b>7.4</b>   | +0.00    | <b>0.333</b> | +0.00     |
| Turkmenistan | TRK     | 2521   | 16079   | 7588    | 943    | 8531    | <b>6.4</b>   | +2.80    | <b>0.531</b> | +0.17     |
| Uzbekistan   | UTI     | 3645   | 32191   | 15441   | 2163   | 17604   | <b>8.8</b>   | +9.47    | <b>0.547</b> | +1.90     |
| Ukraine      | UZ      | 22302  | 303652  | 172840  | 51767  | 276374  | <b>13.6</b>  | +0.84    | <b>0.910</b> | +9.79     |
| Czech R.     | CD      | 9365   | 84450   | 18994   | 7266   | 26260   | <b>9.0</b>   | -4.11    | <b>0.311</b> | +17.07    |
| Estonia      | EVR     | 968    | 5674    | 7788    | 261    | 8049    | <b>5.9</b>   | -3.17    | <b>1.419</b> | +14.53    |

**(b) Productivity of freight transport**

| Country      | Railway | Length<br>of<br>network | Number<br>of employees | Gross<br>tkm | Net<br>tkm | Per km of network |          |               |          | Per employee |          |              |          |
|--------------|---------|-------------------------|------------------------|--------------|------------|-------------------|----------|---------------|----------|--------------|----------|--------------|----------|
|              |         |                         |                        |              |            | gross tkm         | +,- 99r. | net pkm       | +,- 99r. | gross tkm    | +,- 99r. | net tkm      | +,- 99r. |
|              |         | Km                      |                        | Mil.         | Mil.       | Mil.              | %        | Mil.          | %        | Mil.         | %        | Mil.         | %        |
| Azerbaijan   | AZ      | 2116                    | 22271                  | 11237        | 5770       | <b>5.310</b>      | +14.03   | <b>2.727</b>  | +10.43   | <b>0.505</b> | +19.75   | <b>0.259</b> | +15.96   |
| Belarus      | BC      | 5512                    | 69755                  | 57977        | 31425      | <b>10.518</b>     | +2.39    | <b>5.701</b>  | +3.14    | <b>0.831</b> | +2.51    | <b>0.451</b> | +3.26    |
| Bulgaria     | BDZ     | 4320                    | 35854                  | 9560         | 5538       | <b>2.213</b>      | +3.18    | <b>1.282</b>  | +3.82    | <b>0.267</b> | +18.57   | <b>0.154</b> | +19.31   |
| Hungary      | MAV     | 7785                    | 48014                  | 15487        | 7779       | <b>1.989</b>      | +2.94    | <b>0.999</b>  | +4.29    | <b>0.323</b> | +5.01    | <b>0.162</b> | +6.38    |
| Vietnam      | DSVN    | 2632                    | 30343                  | 3827         | 1901.5     | <b>1.454</b>      | +32.88   | <b>0.722</b>  | +36.02   | <b>0.126</b> | +29.53   | <b>0.063</b> | +32.58   |
| Georgia      | GR      | 1562                    | 15817                  | 7403         | 3914       | <b>4.739</b>      | +20.18   | <b>2.506</b>  | +22.47   | <b>0.468</b> | +14.03   | <b>0.247</b> | +16.20   |
| Iran         | RAI     | 6688                    | 28091                  | 25558        | 14178.7    | <b>3.821</b>      | -6.41    | <b>2.120</b>  | -3.68    | <b>0.910</b> | -36.24   | <b>0.505</b> | -34.37   |
| Kazakhstan   | KZH     | 13545                   | 113001                 | 208962       | 124983     | <b>15.427</b>     | +31.52   | <b>9.227</b>  | +36.86   | <b>1.849</b> | +41.95   | <b>1.106</b> | +47.72   |
| China        | CSR     | 58656                   | 1536591                | 2031718      | 1333606    | <b>34.638</b>     | -1.25    | <b>22.736</b> | +4.70    | <b>1.322</b> | +1.98    | <b>0.868</b> | +8.13    |
| PDR Korea    | ZC      | 4400                    | ...                    | ...          | ...        | ...               | ...      | ...           | ...      | ...          | ...      | ...          | ...      |
| Kyrgyzstan   | KRG     | 417                     | 3947                   | 625          | 337        | <b>1.499</b>      | -5.30    | <b>0.808</b>  | -5.07    | <b>0.158</b> | -5.73    | <b>0.085</b> | -5.50    |
| Latvia       | LDZ     | 2331                    | 14119                  | 24268        | 13310      | <b>10.411</b>     | +13.16   | <b>5.710</b>  | +12.84   | <b>1.719</b> | +16.59   | <b>0.943</b> | +16.27   |
| Lithuania    | LG      | 1905                    | 13240                  | 17048        | 8918       | <b>8.949</b>      | +12.08   | <b>4.681</b>  | +13.62   | <b>1.288</b> | +15.84   | <b>0.674</b> | +17.44   |
| Moldova      | CFM     | 1139                    | 11021                  | 2803         | 1538       | <b>2.461</b>      | +27.23   | <b>1.350</b>  | +24.95   | <b>0.254</b> | +32.81   | <b>0.140</b> | +30.42   |
| Mongolia     | MTZ     | 1810                    | 7232                   | 7898         | 4293       | <b>4.364</b>      | +25.60   | <b>2.372</b>  | +22.13   | <b>1.092</b> | +26.11   | <b>0.594</b> | +22.62   |
| Poland       | PKP     | 22560                   | 180763                 | 113965       | 54455      | <b>5.052</b>      | -0.86    | <b>2.414</b>  | -0.41    | <b>0.630</b> | +7.79    | <b>0.301</b> | +8.27    |
| Russian F.   | RZD     | 86075                   | 1294700                | 2365624      | 1197495    | <b>27.483</b>     | +12.37   | <b>13.912</b> | +9.98    | <b>1.827</b> | +7.39    | <b>0.925</b> | +5.11    |
| Romania      | CFR     | 11364                   | 95262                  | 35625        | 16431      | <b>3.135</b>      | +12.41   | <b>1.446</b>  | +12.90   | <b>0.374</b> | +14.52   | <b>0.172</b> | +15.02   |
| Slovakia     | ZSR     | 3662                    | 42589                  | 24865        | 11289      | <b>6.790</b>      | +8.32    | <b>3.083</b>  | +13.87   | <b>0.584</b> | +13.54   | <b>0.265</b> | +19.36   |
| Tajikistan   | TDZ     | 547                     | 4036                   | 2232         | 1282       | <b>4.080</b>      | +0.00    | <b>2.344</b>  | +0.00    | <b>0.553</b> | +0.00    | <b>0.318</b> | +0.00    |
| Turkmenistan | TRK     | 2521                    | 16079                  | 13948        | 7588       | <b>5.533</b>      | +0.75    | <b>3.010</b>  | +0.34    | <b>0.867</b> | -1.99    | <b>0.472</b> | -2.39    |
| Uzbekistan   | UTI     | 3645                    | 32191                  | 27783        | 15441      | <b>7.622</b>      | +7.62    | <b>4.236</b>  | +11.22   | <b>0.863</b> | -1.69    | <b>0.480</b> | +1.60    |
| Ukraine      | UZ      | 22302                   | 303652                 | 283890       | 172840     | <b>12.729</b>     | +10.37   | <b>7.750</b>  | +11.40   | <b>0.935</b> | +9.45    | <b>0.569</b> | +10.47   |
| Czech R.     | CD      | 9365                    | 84450                  | 37739        | 18994      | <b>4.030</b>      | +2.42    | <b>2.028</b>  | +15.37   | <b>0.447</b> | +6.80    | <b>0.225</b> | +20.31   |
| Estonia      | EVR     | 968                     | 5674                   | 14081        | 7788       | <b>14.546</b>     | +11.33   | <b>8.045</b>  | +10.94   | <b>2.482</b> | +14.98   | <b>1.373</b> | +14.58   |

**(c) Productivity of passenger transport and productivity of traffic:**

| Country      | Railway | Length of network | Number of employees | pkm    | tkm + pkm | Per km of network |         |               |         | Per employee |         |              |         |
|--------------|---------|-------------------|---------------------|--------|-----------|-------------------|---------|---------------|---------|--------------|---------|--------------|---------|
|              |         |                   |                     |        |           | Pkm               | +- 99r. | tkm + pkm     | +- 99r. | pkm          | +- 99r. | tkm + pkm    | +- 99r. |
|              |         | Km                |                     | Mil.   | Mil.      | Mil.              | %       | Mil.          | %       | Mil.         | %       | Mil.         | %       |
| Azerbaijan   | AZ      | 2116              | 22271               | 493    | 6263      | <b>0.233</b>      | +16.82  | <b>2.960</b>  | +10.91  | <b>0.022</b> | +22.68  | <b>0.281</b> | +16.47  |
| Belarus      | BC      | 5512              | 69755               | 17722  | 66869     | <b>3.215</b>      | +5.24   | <b>12.132</b> | +4.24   | <b>0.254</b> | +5.35   | <b>0.959</b> | +4.36   |
| Bulgaria     | BDZ     | 4320              | 35854               | 3472   | 9010      | <b>0.804</b>      | -9.72   | <b>2.086</b>  | -1.85   | <b>0.097</b> | +3.75   | <b>0.251</b> | +12.79  |
| Hungary      | MAV     | 7785              | 48014               | 6915   | 14694     | <b>0.888</b>      | +3.01   | <b>1.887</b>  | +3.68   | <b>0.144</b> | +5.08   | <b>0.306</b> | +5.77   |
| Vietnam      | DSVN    | 2632              | 30343               | 3200   | 5101.5    | <b>1.216</b>      | +17.60  | <b>1.938</b>  | +23.85  | <b>0.105</b> | +14.63  | <b>0.168</b> | +20.73  |
| Georgia      | GR      | 1562              | 15817               | 453    | 4367      | <b>0.290</b>      | +26.22  | <b>2.796</b>  | +22.85  | <b>0.029</b> | +19.76  | <b>0.276</b> | +16.56  |
| Iran         | RAI     | 6688              | 28091               | 7119   | 21297.7   | <b>1.064</b>      | +5.57   | <b>3.184</b>  | -0.77   | <b>0.253</b> | -28.07  | <b>0.758</b> | -32.40  |
| Kazakhstan   | KZH     | 13545             | 113001              | 10215  | 135198    | <b>0.754</b>      | +15.78  | <b>9.981</b>  | +35.00  | <b>0.090</b> | +24.97  | <b>1.196</b> | +45.71  |
| China        | CSR     | 58656             | 1536591             | 441468 | 1775074   | <b>7.526</b>      | +7.74   | <b>30.262</b> | +5.44   | <b>0.287</b> | +11.26  | <b>1.155</b> | +8.89   |
| PDR Korea    | ZC      | 4400              | ...                 | ...    | ...       | ...               | ...     | ...           | ...     | ...          | ...     | ...          | ...     |
| Kyrgyzstan   | KRG     | 417               | 3947                | 44     | 381       | <b>0.106</b>      | +41.94  | <b>0.914</b>  | -1.30   | <b>0.011</b> | +41.29  | <b>0.097</b> | -1.75   |
| Latvia       | LDZ     | 2331              | 14119               | 715    | 14025     | <b>0.307</b>      | -24.78  | <b>6.017</b>  | +10.04  | <b>0.051</b> | -22.50  | <b>0.993</b> | +13.38  |
| Lithuania    | LG      | 1905              | 13240               | 611    | 9529      | <b>0.321</b>      | -17.99  | <b>5.002</b>  | +10.88  | <b>0.046</b> | -15.23  | <b>0.720</b> | +14.61  |
| Moldova      | CFM     | 1139              | 11021               | 315    | 1853      | <b>0.277</b>      | -8.08   | <b>1.627</b>  | +17.75  | <b>0.029</b> | -4.06   | <b>0.168</b> | +22.91  |
| Mongolia     | MTZ     | 1810              | 7232                | 1070   | 5363      | <b>0.591</b>      | +5.63   | <b>2.963</b>  | +18.44  | <b>0.148</b> | +6.05   | <b>0.742</b> | +18.92  |
| Poland       | PKP     | 22560             | 180763              | 19706  | 74161     | <b>0.873</b>      | -7.08   | <b>3.287</b>  | -2.27   | <b>0.109</b> | +1.03   | <b>0.410</b> | +6.25   |
| Russian F.   | RZD     | 86075             | 1294700             | 131920 | 1461335   | <b>1.533</b>      | +20.23  | <b>16.977</b> | +11.70  | <b>0.102</b> | +14.90  | <b>1.129</b> | +6.75   |
| Romania      | CFR     | 11364             | 95262               | 11632  | 28063     | <b>1.024</b>      | -4.64   | <b>2.469</b>  | +4.90   | <b>0.122</b> | -2.85   | <b>0.295</b> | +6.87   |
| Slovakia     | ZSR     | 3662              | 42589               | 2870   | 14159     | <b>0.784</b>      | -3.30   | <b>3.866</b>  | +9.91   | <b>0.067</b> | +1.36   | <b>0.332</b> | +15.21  |
| Tajikistan   | TDZ     | 547               | 4036                | 61     | 1343      | <b>0.112</b>      | +0.00   | <b>2.455</b>  | +0.00   | <b>0.015</b> | +0.00   | <b>0.333</b> | +0.00   |
| Turkmenistan | TRK     | 2521              | 16079               | 943    | 8531      | <b>0.374</b>      | +30.52  | <b>3.384</b>  | +2.98   | <b>0.059</b> | +26.97  | <b>0.531</b> | +0.17   |
| Uzbekistan   | UTI     | 3645              | 32191               | 2163   | 17604     | <b>0.593</b>      | +13.96  | <b>4.830</b>  | +11.55  | <b>0.067</b> | +4.10   | <b>0.547</b> | +1.90   |
| Ukraine      | UZ      | 22302             | 303652              | 51767  | 276374    | <b>2.321</b>      | +9.59   | <b>12.392</b> | +10.72  | <b>0.170</b> | +8.67   | <b>0.910</b> | +9.79   |
| Czech R.     | CD      | 9365              | 84450               | 7266   | 26260     | <b>0.776</b>      | +4.86   | <b>2.804</b>  | +12.26  | <b>0.086</b> | +9.36   | <b>0.311</b> | +17.07  |
| Estonia      | EVR     | 968               | 5674                | 261    | 8049      | <b>0.270</b>      | +9.66   | <b>8.315</b>  | +10.90  | <b>0.046</b> | +13.26  | <b>1.419</b> | +14.53  |

**(d) Productivity of locomotives and wagons**

| Country      | Railway | net tkm | gross tkm total | average number of locomotives per year | Average number of wagons per year | gross tkm/ locomotives | +- 99r. | net tkm/ wagons | +- 99r. |
|--------------|---------|---------|-----------------|----------------------------------------|-----------------------------------|------------------------|---------|-----------------|---------|
|              |         | Mil.    | Mil.            | locomotives                            | wagons                            | Mil.                   | %       | Mil.            | %       |
| Azerbaijan   | AZ      | 5770    | 13115           | 515                                    | 24500                             | <b>25.466</b>          | +10.04  | <b>0.236</b>    | +19.31  |
| Belarus      | BC      | 31425   | 72846           | ...                                    | ...                               | ...                    | ...     | ...             | ...     |
| Bulgaria     | BDZ     | 5538    | 15948           | 672                                    | 30568                             | <b>23.732</b>          | -0.73   | <b>0.181</b>    | +9.60   |
| Hungary      | MAV     | 7779    | 27881           | 1071.2                                 | 20608                             | <b>26.028</b>          | +0.39   | <b>0.377</b>    | +22.99  |
| Vietnam      | DSVN    | 1901.5  | 7491            | 341                                    | 4308                              | <b>21.968</b>          | +18.89  | <b>0.441</b>    | +43.02  |
| Georgia      | GR      | 3914    | 8751            | 380                                    | 16769                             | <b>23.029</b>          | +24.83  | <b>0.233</b>    | +21.26  |
| Iran         | RAI     | 14178.7 | 33359           | 555                                    | 15799.92                          | <b>60.107</b>          | +0.60   | <b>0.897</b>    | +11.33  |
| Kazakhstan   | KZH     | 124983  | 233693          | 1993                                   | 90095                             | <b>117.257</b>         | +36.31  | <b>1.387</b>    | +51.31  |
| China        | CSR     | 1333606 | 2425067         | 13768                                  | 438580                            | <b>176.138</b>         | -2.86   | <b>3.041</b>    | +5.12   |
| PDR Korea    | ZC      | ...     | ...             | ...                                    | ...                               | ...                    | ...     | ...             | ...     |
| Kyrgyzstan   | KRG     | 337     | 836             | 47                                     | 2794                              | <b>17.787</b>          | ...     | <b>0.121</b>    | -0.62   |
| Latvia       | LDZ     | 13310   | 24946           | 254                                    | 9420                              | <b>98.213</b>          | +14.57  | <b>1.413</b>    | +10.73  |
| Lithuania    | LG      | 8918    | 18305           | 189                                    | ...                               | <b>96.852</b>          | +16.89  | ...             | ...     |
| Moldova      | CFM     | 1538    | 3568            | 84                                     | 12113                             | <b>42.476</b>          | +31.50  | <b>0.127</b>    | +30.59  |
| Mongolia     | MTZ     | 4293    | 9921            | 79                                     | 1598                              | <b>125.582</b>         | +4.85   | <b>2.686</b>    | +28.40  |
| Poland       | PKP     | 54455   | 148400          | 3776                                   | 88988                             | <b>39.301</b>          | +5.52   | <b>0.612</b>    | -7.81   |
| Russian F.   | RZD     | 1197495 | 2650999         | 16688                                  | 547796                            | <b>158.857</b>         | +3.43   | <b>2.186</b>    | +13.69  |
| Romania      | CFR     | 16431   | 59542           | 3187                                   | 117982                            | <b>18.683</b>          | -4.60   | <b>0.139</b>    | +34.20  |
| Slovakia     | ZSR     | 11289   | 30695           | 1158                                   | 26970                             | <b>26.507</b>          | +7.69   | <b>0.419</b>    | +26.41  |
| Tajikistan   | TDZ     | 1282    | 2519            | 59                                     | 2117                              | <b>42.695</b>          | +0.00   | <b>0.606</b>    | +0.00   |
| Turkmenistan | TRK     | 7588    | 17362           | 261                                    | 13125                             | <b>66.521</b>          | +1.12   | <b>0.578</b>    | +4.20   |
| Uzbekistan   | UTI     | 15441   | 31813           | 677                                    | 11234                             | <b>46.991</b>          | +24.54  | <b>1.374</b>    | +27.02  |
| Ukraine      | UZ      | 172840  | 354920          | 4560                                   | 178308                            | <b>77.833</b>          | +4.59   | <b>0.969</b>    | +23.13  |
| Czech R.     | CD      | 18994   | 50197           | 2737                                   | 58490                             | <b>18.340</b>          | +0.70   | <b>0.325</b>    | +27.26  |
| Estonia      | EVR     | 7788    | 14239           | 104                                    | 7267                              | <b>136.913</b>         | +18.31  | <b>1.072</b>    | +6.53   |

# **Railway productivity indicators for 2001**

## **(a) Labour productivity:**

| Country      | Railway | Length<br>of<br>Net. | Number<br>of<br>Employ. | net<br>tkm | pkm    | tkm+<br>ркм | productivity |          |                        |          |
|--------------|---------|----------------------|-------------------------|------------|--------|-------------|--------------|----------|------------------------|----------|
|              |         |                      |                         |            |        |             | empl/ km     | +,- 2000 | (tkm+ркм)/<br>employee | +,- 2000 |
|              |         | Km                   |                         | Mil.       | Mil.   | Mil.        |              | %        | Mil.                   | %        |
| Azerbaijan   | AZ      | 2116                 | 21686                   | 6142       | 537    | 6679        | <b>10.2</b>  | -2.63    | <b>0.308</b>           | +9.52    |
| Belarus      | BC      | 5509                 | 62951                   | 29727      | 15264  | 60255       | <b>11.4</b>  | -9.70    | <b>0.957</b>           | -0.15    |
| Bulgaria     | BDZ     | 4320                 | 35071                   | 4904       | 2990   | 7894        | <b>8.1</b>   | -2.18    | <b>0.225</b>           | -10.43   |
| Hungary      | MAV     | 7516                 | 51037                   | 6502       | 7264   | 13766       | <b>6.8</b>   | +10.10   | <b>0.270</b>           | -11.86   |
| Vietnam      | DSVN    | 2347                 | 30343                   | 2000       | 3426   | 5426        | <b>12.9</b>  | +12.14   | <b>0.179</b>           | +6.36    |
| Georgia      | GR      | 1565                 | 15817                   | 4481       | 401    | 4882        | <b>10.1</b>  | -0.19    | <b>0.309</b>           | +11.78   |
| Iran         | RAI     | 7156                 | 26673                   | 14613      | 8043   | 22656       | <b>3.7</b>   | -11.26   | <b>0.849</b>           | +12.03   |
| Kazakhstan   | KZH     | 13597                | 83474                   | 135653     | 10384  | 146037      | <b>6.1</b>   | -26.41   | <b>1.749</b>           | +46.23   |
| China        | CSR     | 59079                | 2537233                 | 1424980    | 463655 | 1888635     | <b>42.9</b>  | +63.94   | <b>0.744</b>           | -35.56   |
| PDR Korea    | ZC      | 4400                 | ...                     | 0          |        | 0           |              |          |                        |          |
| Kyrgyzstan   | KRG     | 417                  | 4105                    | 332        | 50     | 382         | <b>9.8</b>   | +4.00    | <b>0.093</b>           | -3.70    |
| Latvia       | LDZ     | 2305                 | 13467                   | 14179      | 706    | 14885       | <b>5.8</b>   | -3.54    | <b>1.105</b>           | +11.27   |
| Lithuania    | LG      | 1696                 | 11871                   | 7741       | 533    | 8274        | <b>7.0</b>   | +0.71    | <b>0.697</b>           | -3.16    |
| Moldova      | CFM     | 1121                 | 11175                   | 2049       | 325    | 2374        | <b>10.0</b>  | +3.03    | <b>0.212</b>           | +26.35   |
| Mongolia     | MTZ     | 1810                 | 7176                    | 5287       | 1072   | 6359        | <b>4.0</b>   | -0.77    | <b>0.886</b>           | +19.50   |
| Poland       | PKP     | 20134                | 156337                  | 47918      | 18208  | 66126       | <b>7.8</b>   | -3.09    | <b>0.423</b>           | +3.10    |
| Russian F.   | RZD     | 85835                | 1239800                 | 1249166    | 125834 | 1500834     | <b>14.4</b>  | -3.97    | <b>1.211</b>           | +7.25    |
| Romania      | CFR     | 11364                | 93238                   | 15914      | 10965  | 26879       | <b>8.2</b>   | -2.12    | <b>0.288</b>           | -2.14    |
| Slovakia     | ZSR     | 3662                 | 40447                   | 10929      | 2805   | 13734       | <b>11.0</b>  | -5.02    | <b>0.340</b>           | +2.14    |
| Tajikistan   | TDZ     | 612                  | 4549                    | 1250       | 33     | 1283        | <b>7.4</b>   | +0.69    | <b>0.282</b>           | -15.27   |
| Turkmenistan | TRK     | 2523                 | 14330                   | 6437       | 1118   | 7555        | <b>5.7</b>   | -10.96   | <b>0.527</b>           | -0.63    |
| Uzbekistan   | UTI     | 3645                 | 32921                   | 15441      | 2163   | 17604       | <b>9.0</b>   | +2.27    | <b>0.535</b>           | -2.22    |
| Ukraine      | UZ      | 22219                | 305970                  | 177465     | 52661  | 282787      | <b>13.8</b>  | +1.14    | <b>0.924</b>           | +1.55    |
| Czech R.     | CD      | 9444                 | 82426                   | 18375      | 7262   | 25637       | <b>8.7</b>   | -3.21    | <b>0.311</b>           | +0.02    |
| Estonia      | EVR     | 967                  | 5116                    | 8222       | 183    | 8405        | <b>5.3</b>   | -9.74    | <b>1.643</b>           | +15.81   |

**(b) Productivity of freight transport:**

| Country      | Railway | Length<br>of<br>network | Number<br>of employees | Gross<br>tkm | Net<br>tkm | Per km of network |           |               |           | Per employee |           |              |           |
|--------------|---------|-------------------------|------------------------|--------------|------------|-------------------|-----------|---------------|-----------|--------------|-----------|--------------|-----------|
|              |         |                         |                        |              |            | gross tkm         | +, - 2000 | net pkm       | +, - 2000 | gross tkm    | +, - 2000 | net tkm      | +, - 2000 |
|              |         | Km                      |                        | Mil.         | Mil.       | Mil.              | %         | Mil.          | %         | Mil.         | %         | Mil.         | %         |
| Azerbaijan   | AZ      | 2116                    | 21686                  | 11932        | 6142       | <b>5.639</b>      | +6.19     | <b>2.903</b>  | +6.45     | <b>0.550</b> | +9.05     | <b>0.283</b> | +9.32     |
| Belarus      | BC      | 5509                    | 62951                  | 55536        | 29727      | <b>10.081</b>     | -4.16     | <b>5.396</b>  | -5.35     | <b>0.882</b> | +6.14     | <b>0.472</b> | +4.82     |
| Bulgaria     | BDZ     | 4320                    | 35071                  | 9674         | 4904       | <b>2.239</b>      | +1.19     | <b>1.135</b>  | -11.45    | <b>0.276</b> | +3.45     | <b>0.140</b> | -9.47     |
| Hungary      | MAV     | 7516                    | 51037                  | 15030        | 6502       | <b>2.000</b>      | +0.52     | <b>0.865</b>  | -13.43    | <b>0.294</b> | -8.70     | <b>0.127</b> | -21.37    |
| Vietnam      | DSVN    | 2347                    | 30343                  | 4572         | 2000       | <b>1.948</b>      | +33.97    | <b>0.852</b>  | +17.95    | <b>0.151</b> | +19.47    | <b>0.066</b> | +5.18     |
| Georgia      | GR      | 1565                    | 15817                  | 8377         | 4481       | <b>5.353</b>      | +12.94    | <b>2.863</b>  | +14.26    | <b>0.530</b> | +13.15    | <b>0.283</b> | +14.48    |
| Iran         | RAI     | 7156                    | 26673                  | 26085        | 14613      | <b>3.645</b>      | -4.61     | <b>2.042</b>  | -3.68     | <b>0.978</b> | +7.49     | <b>0.548</b> | +8.54     |
| Kazakhstan   | KZH     | 13597                   | 83474                  | 223083       | 135653     | <b>16.407</b>     | +6.35     | <b>9.977</b>  | +8.12     | <b>2.672</b> | +44.52    | <b>1.625</b> | +46.93    |
| China        | CSR     | 59079                   | 2537233                | ...          | 1424980    | ...               |           | <b>24.120</b> | +6.09     | ...          |           | <b>0.562</b> | -35.29    |
| PDR Korea    | ZC      | 4400                    | ...                    |              |            |                   |           |               |           |              |           |              |           |
| Kyrgyzstan   | KRG     | 417                     | 4105                   | 611          | 332        | <b>1.465</b>      | -2.24     | <b>0.795</b>  | -1.60     | <b>0.149</b> | -6.00     | <b>0.081</b> | -5.39     |
| Latvia       | LDZ     | 2305                    | 13467                  | 25724        | 14179      | <b>11.161</b>     | +7.20     | <b>6.152</b>  | +7.74     | <b>1.910</b> | +11.13    | <b>1.053</b> | +11.69    |
| Lithuania    | LG      | 1696                    | 11871                  | 14897        | 7741       | <b>8.784</b>      | -1.85     | <b>4.564</b>  | -2.50     | <b>1.255</b> | -2.54     | <b>0.652</b> | -3.19     |
| Moldova      | CFM     | 1121                    | 11175                  | 3651         | 2049       | <b>3.257</b>      | +32.34    | <b>1.828</b>  | +35.36    | <b>0.327</b> | +28.46    | <b>0.183</b> | +31.39    |
| Mongolia     | MTZ     | 1810                    | 7176                   | 9548         | 5287       | <b>5.275</b>      | +20.89    | <b>2.921</b>  | +23.15    | <b>1.331</b> | +21.83    | <b>0.737</b> | +24.12    |
| Poland       | PKP     | 20134                   | 156337                 | 102223       | 47918      | <b>5.077</b>      | +0.50     | <b>2.380</b>  | -1.40     | <b>0.654</b> | +3.71     | <b>0.307</b> | +1.74     |
| Russian F.   | RZD     | 85835                   | 1239800                | 2488515      | 1249166    | <b>28.992</b>     | +5.49     | <b>14.553</b> | +4.61     | <b>2.007</b> | +9.85     | <b>1.008</b> | +8.93     |
| Romania      | CFR     | 11364                   | 93238                  | 34861        | 15914      | <b>3.068</b>      | -2.14     | <b>1.400</b>  | -3.15     | <b>0.374</b> | -0.02     | <b>0.171</b> | -1.04     |
| Slovakia     | ZSR     | 3662                    | 40447                  | 23514        | 10929      | <b>6.422</b>      | -5.43     | <b>2.985</b>  | -3.18     | <b>0.581</b> | -0.43     | <b>0.270</b> | +1.94     |
| Tajikistan   | TDZ     | 612                     | 4549                   | 2161         | 1250       | <b>3.529</b>      | -13.51    | <b>2.041</b>  | -12.89    | <b>0.475</b> | -14.10    | <b>0.275</b> | -13.49    |
| Turkmenistan | TRK     | 2523                    | 14330                  | 12047        | 6437       | <b>4.774</b>      | -13.71    | <b>2.551</b>  | -15.25    | <b>0.841</b> | -3.09     | <b>0.449</b> | -4.81     |
| Uzbekistan   | UTI     | 3645                    | 32921                  | 28743        | ...        | <b>7.886</b>      | +3.46     | ...           |           | <b>0.873</b> | +1.16     | ...          |           |
| Ukraine      | UZ      | 22219                   | 305970                 | 290916       | 177465     | <b>13.093</b>     | +2.86     | <b>7.987</b>  | +3.06     | <b>0.951</b> | +1.70     | <b>0.580</b> | +1.90     |
| Czech R.     | CD      | 9444                    | 82426                  | 36535        | 18375      | <b>3.869</b>      | -4.00     | <b>1.946</b>  | -4.07     | <b>0.443</b> | -0.81     | <b>0.223</b> | -0.88     |
| Estonia      | EVR     | 967                     | 5116                   | 14557        | 8222       | <b>15.054</b>     | +3.49     | <b>8.503</b>  | +5.68     | <b>2.845</b> | +14.66    | <b>1.607</b> | +17.09    |

**(c) Productivity of passenger transport and productivity of traffic:**

| Country      | Railway | Length of network | Number of employees | pkm    | tkm + pkm | Per km of network |          |               |          | Per employee |          |              |          |
|--------------|---------|-------------------|---------------------|--------|-----------|-------------------|----------|---------------|----------|--------------|----------|--------------|----------|
|              |         |                   |                     |        |           | Pkm               | +,- 2000 | tkm + pkm     | +,- 2000 | pkm          | +,- 2000 | tkm + pkm    | +,- 2000 |
|              |         | Km                |                     | Mil.   | Mil.      | Mil.              | %        | Mil.          | %        | Mil.         | %        | Mil.         | %        |
| Azerbaijan   | AZ      | 2116              | 21686               | 537    | 6679      | <b>0.254</b>      | +8.88    | <b>3.156</b>  | +6.64    | <b>0.025</b> | +11.82   | <b>0.308</b> | +9.52    |
| Belarus      | BC      | 5509              | 62951               | 15264  | 60255     | <b>2.771</b>      | -13.82   | <b>10.938</b> | -9.84    | <b>0.242</b> | -4.56    | <b>0.957</b> | -0.15    |
| Bulgaria     | BDZ     | 4320              | 35071               | 2990   | 7894      | <b>0.692</b>      | -13.88   | <b>1.827</b>  | -12.39   | <b>0.085</b> | -11.96   | <b>0.225</b> | -10.43   |
| Hungary      | MAV     | 7516              | 51037               | 7264   | 13766     | <b>0.966</b>      | +8.80    | <b>1.832</b>  | -2.97    | <b>0.142</b> | -1.18    | <b>0.270</b> | -11.86   |
| Vietnam      | DSVN    | 2347              | 30343               | 3426   | 5426      | <b>1.460</b>      | +20.06   | <b>2.312</b>  | +19.28   | <b>0.113</b> | +7.06    | <b>0.179</b> | +6.36    |
| Georgia      | GR      | 1565              | 15817               | 401    | 4882      | <b>0.256</b>      | -11.67   | <b>3.119</b>  | +11.57   | <b>0.025</b> | -11.50   | <b>0.309</b> | +11.78   |
| Iran         | RAI     | 7156              | 26673               | 8043   | 22656     | <b>1.124</b>      | +5.59    | <b>3.166</b>  | -0.58    | <b>0.302</b> | +18.99   | <b>0.849</b> | +12.03   |
| Kazakhstan   | KZH     | 13597             | 83474               | 10384  | 146037    | <b>0.764</b>      | +1.27    | <b>10.741</b> | +7.61    | <b>0.124</b> | +37.61   | <b>1.749</b> | +46.23   |
| China        | CSR     | 59079             | 2537233             | 463655 | 1888635   | <b>7.848</b>      | +4.27    | <b>31.968</b> | +5.64    | <b>0.183</b> | -36.39   | <b>0.744</b> | -35.56   |
| PDR Korea    | ZC      | 4400              | ...                 |        |           |                   |          |               |          |              |          |              |          |
| Kyrgyzstan   | KRG     | 417               | 4105                | 50     | 382       | <b>0.120</b>      | +13.64   | <b>0.915</b>  | +0.16    | <b>0.012</b> | +9.26    | <b>0.093</b> | -3.70    |
| Latvia       | LDZ     | 2305              | 13467               | 706    | 14885     | <b>0.306</b>      | -0.14    | <b>6.458</b>  | +7.33    | <b>0.052</b> | +3.52    | <b>1.105</b> | +11.27   |
| Lithuania    | LG      | 1696              | 11871               | 533    | 8274      | <b>0.314</b>      | -2.02    | <b>4.879</b>  | -2.47    | <b>0.045</b> | -2.71    | <b>0.697</b> | -3.16    |
| Moldova      | CFM     | 1121              | 11175               | 325    | 2374      | <b>0.290</b>      | +4.83    | <b>2.118</b>  | +30.17   | <b>0.029</b> | +1.75    | <b>0.212</b> | +26.35   |
| Mongolia     | MTZ     | 1810              | 7176                | 1072   | 6359      | <b>0.592</b>      | +0.19    | <b>3.513</b>  | +18.57   | <b>0.149</b> | +0.97    | <b>0.886</b> | +19.50   |
| Poland       | PKP     | 20134             | 156337              | 18208  | 66126     | <b>0.904</b>      | +3.53    | <b>3.284</b>  | -0.09    | <b>0.116</b> | +6.83    | <b>0.423</b> | +3.10    |
| Russian F.   | RZD     | 85835             | 1239800             | 125834 | 1500834   | <b>1.466</b>      | -4.35    | <b>17.485</b> | +2.99    | <b>0.101</b> | -0.39    | <b>1.211</b> | +7.25    |
| Romania      | CFR     | 11364             | 93238               | 10965  | 26879     | <b>0.965</b>      | -5.73    | <b>2.365</b>  | -4.22    | <b>0.118</b> | -3.69    | <b>0.288</b> | -2.14    |
| Slovakia     | ZSR     | 3662              | 40447               | 2805   | 13734     | <b>0.766</b>      | -2.26    | <b>3.751</b>  | -2.99    | <b>0.069</b> | +2.91    | <b>0.340</b> | +2.14    |
| Tajikistan   | TDZ     | 612               | 4549                | 33     | 1283      | <b>0.053</b>      | -52.26   | <b>2.095</b>  | -14.68   | <b>0.007</b> | -52.58   | <b>0.282</b> | -15.27   |
| Turkmenistan | TRK     | 2523              | 14330               | 1118   | 7555      | <b>0.443</b>      | +18.45   | <b>2.994</b>  | -11.52   | <b>0.078</b> | +33.03   | <b>0.527</b> | -0.63    |
| Uzbekistan   | UTI     | 3645              | 32921               | ...    | ...       | ...               |          | ...           |          | ...          |          | ...          |          |
| Ukraine      | UZ      | 22219             | 305970              | 52661  | 282787    | <b>2.370</b>      | +2.11    | <b>12.727</b> | +2.70    | <b>0.172</b> | +0.96    | <b>0.924</b> | +1.55    |
| Czech Rep.   | CD      | 9444              | 82426               | 7262   | 25637     | <b>0.769</b>      | -0.89    | <b>2.715</b>  | -3.19    | <b>0.088</b> | +2.40    | <b>0.311</b> | +0.02    |
| Estonia      | EVR     | 967               | 5116                | 183    | 8405      | <b>0.189</b>      | -29.81   | <b>8.692</b>  | +4.53    | <b>0.036</b> | -22.24   | <b>1.643</b> | +15.81   |

**(d) Productivity of locomotives and wagons**

| Country      | Railway | net<br>tkm | gross<br>tkm<br>total | average<br>number<br>of<br>locomotives<br>per year | Average<br>number<br>of<br>wagons<br>per year | gross tkm/<br>locomotives | +,-<br>2000 | net<br>tkm/<br>wagons | +,-<br>2000 |
|--------------|---------|------------|-----------------------|----------------------------------------------------|-----------------------------------------------|---------------------------|-------------|-----------------------|-------------|
|              |         | Mil.       | Mil.                  | locomotives                                        | wagons                                        | Mil.                      | %           | Mil.                  | %           |
| Azerbaijan   | AZ      | 6142       | 13687                 | ...                                                | 23069                                         | ...                       |             | <b>0.266</b>          | +13.05      |
| Belarus      | BC      | 29727      | 70758                 | ...                                                | ...                                           | ...                       |             | ...                   |             |
| Bulgaria     | BDZ     | 4904       | 15623                 | 652                                                | 16609                                         | <b>23.962</b>             | +0.97       | <b>0.295</b>          | +62.98      |
| Hungary      | MAV     | 6502       | 27849                 | 1023                                               | 19600                                         | <b>27.223</b>             | +4.59       | <b>0.332</b>          | -12.12      |
| Vietnam      | DSVN    | 2000       | 7896                  | 369                                                | 4329                                          | <b>21.398</b>             | -2.59       | <b>0.462</b>          | +4.67       |
| Georgia      | GR      | 4481       | 9741                  | 400.8                                              | 15809                                         | <b>24.303</b>             | +5.53       | <b>0.283</b>          | +21.43      |
| Iran         | RAI     | 14613      | 34531                 | 566.7                                              | 17068                                         | <b>60.934</b>             | +1.38       | <b>0.856</b>          | -4.59       |
| Kazakhstan   | KZH     | 135653     | 249215                | 1870.3                                             | 85939                                         | <b>133.249</b>            | +13.64      | <b>1.578</b>          | +13.79      |
| China        | CSR     | 1424980    | 2770693               | 14460                                              | 448535                                        | <b>191.611</b>            | +8.78       | <b>3.177</b>          | +4.48       |
| PDR Korea    | ZC      |            |                       |                                                    |                                               |                           |             |                       |             |
| Kyrgyzstan   | KRG     | 332        | 826                   | 47                                                 | 2759                                          | <b>17.574</b>             | -1.20       | <b>0.120</b>          | -0.35       |
| Latvia       | LDZ     | 14179      | 26330                 | 239                                                | 8880                                          | <b>110.167</b>            | +12.17      | <b>1.597</b>          | +13.01      |
| Lithuania    | LG      | 7741       | 16079                 | 172                                                | ...                                           | <b>93.483</b>             | -3.48       | ...                   |             |
| Moldova      | CFM     | 2049       | 4373                  | 91                                                 | 10316                                         | <b>48.055</b>             | +13.13      | <b>0.199</b>          | +56.43      |
| Mongolia     | MTZ     | 5287       | 11578                 | 82                                                 | 1633                                          | <b>141.195</b>            | +12.43      | <b>3.238</b>          | +20.51      |
| Poland       | PKP     | 47918      | 135379                | 3744                                               | ...                                           | <b>36.159</b>             | -7.99       | ...                   |             |
| Russian F.   | RZD     | 1249166    | 2770033               | 17128                                              | 540547                                        | <b>161.725</b>            | +1.81       | <b>2.311</b>          | +5.71       |
| Romania      | CFR     | 15914      | 58302                 | 2889                                               | 92865                                         | <b>20.181</b>             | +8.02       | <b>0.171</b>          | +23.05      |
| Slovakia     | ZSR     | 10929      | 29236                 | 1114                                               | 24587                                         | <b>26.244</b>             | -0.99       | <b>0.445</b>          | +6.19       |
| Tajikistan   | TDZ     | 1250       | 2299                  | 57                                                 | 2541                                          | <b>40.332</b>             | -5.54       | <b>0.492</b>          | -18.77      |
| Turkmenistan | TRK     | 6437       | 15096                 | 163.5                                              | 12983                                         | <b>92.330</b>             | +38.80      | <b>0.496</b>          | -14.24      |
| Uzbekistan   | UTI     | 15441      | 32033                 | 1035                                               | ...                                           | <b>30.950</b>             | -34.14      | ...                   |             |
| Ukraine      | UZ      | 177465     | 361182                | 4474                                               | 201951                                        | <b>80.729</b>             | +3.72       | <b>0.879</b>          | -9.34       |
| Czech R.     | CD      | 18375      | 48740                 | 2591                                               | 54334                                         | <b>18.811</b>             | +2.57       | <b>0.338</b>          | +4.14       |
| Estonia      | EVR     | 8222       | 14707                 | 116.5                                              | 6122                                          | <b>126.240</b>            | -7.80       | <b>1.343</b>          | +25.32      |

**Remarks**

1. Steam locomotives and their productivity have not been included in the calculation (except for CSR and DSVN).
2. OSZhD has no data on the productivity of individual railway lines or the energy consumption of railways, nor does it have any information on high-speed trains.
3. Railway personnel shown comprise only those whose main activity is transport operations.