

1995 ECONOMIC COMMISSION FOR EUROPE (UN/ECE)

**CENSUS OF MOTOR TRAFFIC ON
MAIN INTERNATIONAL TRAFFIC ARTERIES**

COMMISSION ECONOMIQUE POUR L'EUROPE (ONU/CEE)

**RECENSEMENT DE LA CIRCULATION
MOTORISEE SUR LES GRANDES ROUTES
DE CIRCULATION INTERNATIONALE**

UNITED NATIONS

E C O N O M I C



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UNITED NATIONS



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1995 CENSUS OF MOTOR TRAFFIC ON MAIN INTERNATIONAL TRAFFIC ARTERIES IN EUROPE

Introduction

At its fifty-sixth session, the Inland Transport Committee of the United Nations Economic Commission for Europe (UN/ECE) adopted Resolution No. 242 on 21 January 1994 inviting Governments members of the ECE to take a census of traffic on the main international traffic arteries in their country (E Roads) in accordance with the European Agreement on Main International Traffic Arteries (AGR), 1975.

As in past years, Governments were requested to transmit to the ECE secretariat the relevant data in line with the recommendations and considerations set forth in the Ad Hoc Session on the Road Traffic Census (TRANS/WP.6/AC.2/12 and Add.1), considering 1995 as the reference year. The deadline for submission of 1995 data was 31 March, 1997.

For the first time, the secretariat has undertaken the preparation of the results of the E Road Census in the context of a geographic information system (GIS). The Automation and Geographic Application of the E Road Census was a project conceived jointly by the ECE secretariat and the Institut for Territorial Studies in Barcelona (IET), with the maps and statistical tables printed by the Cartographic Institute of Catalonia (ICC). The objectives of the project were to facilitate the database management for 1995 and future E Road Censuses, to enhance the use and presentation of Census results, and allow for improved spatial analysis by Governments and other users for effective transport planning, land use and infrastructure development on the E Road network.

The statistical tables and accompanying maps are based on data received from the following countries: Austria, Belarus, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, The former Yugoslav Republic of Macedonia, Turkey, Ukraine and the United Kingdom. For countries whose data was submitted late or incomplete, a corrigendum will be issued at a later date, if sufficient resources are available.

For further information on the **UN/ECE E Road Census Programme**, please contact: **Brinda Wachs Shimizu**, Economic Affairs Officer, Transport Division, United Nations Economic Commission for Europe, Palais des Nations, Ch-1211 Geneva 10 (Tel.: +41-22-917-2452/Fax: +917-0039 / e-mail: Brinda.Wachs@unece.org). For further information on the **Automation and Geographic Application of the Census**, please contact **Francesc Carbonell or Nuria Majo**, Institut D'Estudis Territorials (IET), Generalitat de Catalunya, Department de Política Territorial, Pla Territorial Metropolità de Barcelona, Calle Wellington 19, 08018, Barcelona (Tel.: + 343-485-1193 / Fax: + 343-485-0359 / e-mail: ptmbcm@cinet.fcr.es). For further information on the printing of the maps and statistical **reports**, please contact **Jaume Miranda Canals**, Director, Generalitat de Catalunya, Department de Política Territorial, Obres Públiques, Institut Cartogràfic de Catalunya, parc de Montjuic, 08038 Barcelona, (Tel.: +343-425-2900 / Fax: +343-426-7442).

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In accordance with the Recommendations set forth by Governments in the Ad Hoc Meeting on the Road Traffic Census (22-23 November 1993) (TRANS/WP.6/AC.2/12 and Add.1), the results of the 1995 E Road Census consist of the following statistical tables:

Table No. 1:	Length of Road by Width and by Number of Carriageways and Lanes at the end of 1990 and 1995;
Table No. 2:	Length of E Road Sections by Average Annual Daily Traffic (AADT);
Table No. 3:	Counting Posts on E Roads in 1995;
Table No. 4:	Distribution of Motor Traffic in 1995 by Vehicle Category, (for all E roads and for each E road);
Table No. 4bis:	Distribution of Motor Traffic in 1995 by Vehicle Category and by Night Traffic, Holiday Traffic and Peak-hour Traffic;
Table No. 5:	Length and Usage of Roads (vehicle kilometres by vehicle category and by type of road);
Table No. 6:	Maps
Table No. 7:	1995 Motor Traffic Density Data at Counting Posts on E Roads shown on the Accompanying Map(s)

Vehicle Categories

Vehicle categories, the number of which was reduced by Governments in 1993 from 10 to 5, are as follows. For purposes of Tables 4 and 4bis, categories A,B and E constitute "light motor traffic," while categories C and D constitute "heavy motor traffic."

Category A: Motor vehicles with not more than 3 wheels (motor cycles with or without sidecars, including motor scooters, and motor tricycles) (corresponding to previous UN/ECE category (c));

Category B: Passenger and light goods vehicles (vehicles, including station wagons, with not more than nine seats, including the driver's seat, and light vans with a permissible maximum weight of not more than 3.5 tonnes). Passenger and light goods vehicles are recorded as such, irrespective of whether they are with or without trailers, including caravans and recreational vehicles (corresponding to previous UN/ECE categories (d) and (e));

Category C: Goods road vehicles (lorries with a permissible maximum weight of more than 3.5 tonnes, lorries with one or more trailers; tractors with semi-trailers and one or more trailers; tractors with one or more trailers), (corresponding to previous UN/ECE categories

(f), (g) and (h));

Category D: Motor buses, coaches and trolley buses (corresponding to previous UN/ECE category (i));

Category E: Special vehicles (agricultural tractors, special vehicles such as self-propelled rollers, bulldozers, mobile cranes and army tanks and other road motor vehicles not specified elsewhere), (corresponding to previous UN/ECE category (j)).

Where possible, data are included for both 1990 and 1995. The non-inclusion of a country in any of the tables indicates that no data were supplied for either year. Some figures may not add up due to rounding.

The following symbols are used:

... = not available
- = magnitude zero
0 = magnitude not zero but less than half of the units employed

Country Notes

The data supplied and accompanying country notes are provided on the following pages:

Austria

Belarus

Belgium

Bulgaria

Croatia

Czech Republic

Denmark

Estonia

Finland

France

Germany

Hungary

Lithuania

Luxembourg

Netherlands

Norway

Poland

Portugal

Romania

Slovakia

Slovenia

Spain

Sweden

Switzerland

The former Yugoslav Republic of Macedonia
l'ex-République yougoslave de Macédoine

Turkey

Ukraine

United Kingdom

COUNTRY NOTES ^{1/}

BELGIUM

Waiting for translation from French to English.

CZECH REPUBLIC

1995 Census data in the Czech Republic is based on the results of general traffic counts taken on the entire motorway network of the country and on a major part of other roads on the Czech territory. The Census was undertaken by means of statistical samples representing the period April-October, with each sample comprised of four hours of different time periods during the day (a.m. or p.m.). Using these samples and empirical factors, values of average daily traffic (ADT) in 1995 were calculated. Supplementary night counts beyond normal limits of the Census were carried out only at selected counting posts on the E roads. Traffic was counted during one counting period in spring and one in summer. Counting posts on the E network were selected in conformity with the data obtained; as a rule, the same locations were used as for the national traffic census in 1990. The earlier numbering of counting posts was also retained. Changes have been made only at places where new road construction projects or route modifications of E roads caused substantial changes of condition. Lengths of road section, numbers of traffic lanes and carriageway widths have been changed for the same reasons.

Notes to the tables and the map

Table 1: The distribution by carriageway widths refers to non-urban (rural) E roads only. The length of the E roads in urban areas is given in Part 3 of the table as "unknown". Classification by carriageway widths was not available here.

Table 2: The break-up of lengths of the E roads by their traffic volumes has been carried out for non-urban E roads only.

Table 3: All lengths of single E roads are given including sections which are common with other E roads. Lengths of common sections are shown in brackets. The same applies to the numbering of counting posts.

Table 4: The values of average traffic have been ascertained for sections of the E roads in nonurban (rural) areas.

Table 4bis: The values of average traffic have been ascertained for section of the E roads in nonurban (rural) areas. Since night counts were not effected in 1990, the required comparison of night ADT was not possible. Holiday traffic and peak-hour traffic were not estimated in 1995. Traffic on motorways was counted by automatic traffic counters, registering only total numbers of vehicles. Supplementary manual counts by categories of vehicles were executed only to a limited extent; therefore it was not always possible to find out the pattern of holiday traffic composition in summer, so that the required data to characterize traffic composition on

some routes are missing. The respective data are also not shown for the 50th hour because the methodology used for 50th hour traffic estimation in the Czech Republic does not allow for such details.

Table 5: All motorways and most express roads in the Czech Republic form part of the E road network. Therefore, there are no data in the rows for motorways in Table 5, while in the rows for express roads only such data are shown which refer to express roads not included in the E network. Traffic performance was estimated by means of a detailed analysis and comparison of results of national traffic censuses in 1990 and 1995 for all motorways and all-purpose roads, including sections in urban areas.

Table 6 (Map) and Table 7: The sections are numbered identically with the 1990 Census to facilitate comparison. Changes of routes of the E roads due to new construction or route modification (shift to other roads) were included. Therefore some section numbers have been dropped or cancelled. Some section numbers have disappeared also because the numbering of sections is based on a system used in the former Czech and Slovak Federal Republic and the respective sections are now on Slovak territory.

BULGARIA

The 1995 Census was carried out on the national road network on road sections located within the boundaries of populated areas with more than 10,000 citizens. Automatic counts were used, as well as visual monitoring to determine the composition of traffic flows. The methodology was based on a study of total traffic flow and its irregularities over a given time period at selected counting posts, as well as short-term surveillance over a large number of counting posts.

Types of counting posts: (1) Posts for determination of irregularities in the passing of road traffic = main counting posts (MCP); (2) Posts for which the value of average daily traffic volume is determined = additional counting posts (ACP).

Location of counting posts: The road network covered by the traffic count is divided into sections with similar traffic volumes. Border sections are chosen where there is an expected change in traffic volumes and in the composition of traffic flow (intersection, junction, populated place, etc.).

Duration of count: The count of motor vehicles at each MCP had a minimum duration of 7 consecutive days (from Monday to Sunday) during the months from May to September, and 4 consecutive days (from Thursday to Sunday) during all the other months of the year. The count of motor vehicles at each ACP had a minimum duration of 4 working days in the year lasting 14 hours (Wednesday or Thursday) from which 2 days are during the months April and May and 2 days are during the months of July and August, as well as 2 Sundays during the months of July and August.

Types and groups of motor vehicles:

Motor vehicles are classified into 7 groups with the determination of design loading of pavements and of design volume per hour (Table 1)

Calculation of road traffic: Variations in volume over a given period of time (days, weeks, year) are taken into consideration in the determination of traffic on the road network. These variations are determined from the road function and are expressed through relative values (coefficients and unevenness) of holiday traffic and that in the end of the week b_v and characteristics of traffic on which these calculations are based. (1) The coefficient b_v indicates the traffic increase in the working days during the tourist season compared with that in the months with the average traffic volume (May and June) and is determined by the formula:

where $T_{mt,3}$ = the average daily traffic volume in the working days in July and August as a total number of motor vehicles per day (24 hours); $T_{mt,4}$ = average daily traffic volume in the working days in May and June as a total number of motor vehicles per day.

(2) The coefficient b_v indicates the increase of car traffic during the weekends in July and August over that in the working days of the same months and is determined by the formula:

where $T_{mt,3}$ = average daily traffic volume of cars during the holidays in July and August as a number of cars per day; $T_{mt,4}$ = average daily traffic volume of cars in the working days in July and August as a number of cars per day; For more accurate reporting of holiday traffic and of weekend traffic, a differentiation of the values of parameters b_v and b_v are shown in Table 2 below:

Determination of coefficients for traffic irregularity: (1) The coefficient a_x shows the traffic irregularity during a day (24 hours) and is determined by the formula:

where N_{24} = The daily traffic volume as a number for each type of motor vehicle; N_x = the traffic volume for x hours as a number for each type of motor vehicle (MOT/x h, CAR/x h, T1/x h, T2/x h, T3/x h, T4/x h, BUS/x h). The minimum value of x is 14h. This coefficient is determined for each character of traffic, for each type of motor vehicles and month.

(2) The coefficient b_i indicates the irregularity of traffic during the i-day of the week and is determined by the formula:

where N_c = the average weekly traffic volume for the week m for which full weekly surveillance are carried out, as a number for each type of motor vehicles per day (MOT/24h, CAR/24 h, T1/24 h, T2/24 h, T3/24 h, T4/24 h, BUS/24 h); m = the index of the week during which a traffic count is carried out (values from 1 to n). The coefficient B_i is determined for each character of traffic, type of motor vehicle, month during which a count on ACP is done, and day of the week.

(3) The coefficient C_j indicates the irregularity during the j-month of the year and is determined by the formula

where N_p = the average annual traffic volume as a number for each type of motor vehicle per day (MOT/24 h, CAR/24 h, T1/24 h, T2/24 h, T3/24 h, T4/24 h, BUS/24 h); N_j = the average monthly traffic volume in the j-month with dimensions as a N_p ; J = the index of the month during which the traffic count is carried out (values from 1 to 12). The coefficient c_j is determined for each character of traffic, type of motor vehicle and month during ACP counting.

Determination of the average annual daily traffic volumes. The value is determined for ACPs. Values are found separately for the amount of the average annual daily traffic volume at ACPson the basis of data for each month during which a count is carried out.

Where N^m = the average annual daily traffic volume at the ACP on the basis of the data for the month m as a number for each type of motor vehicle/24 h; N_{mx} = x-hour traffic volume at a certain ACP for the month m for each type of motor vehicl/xh; m = the index of the months during the counts (values from 1 to n); A_x , b_i , c_j = as in formulas (3) (4) (5). The final value of the average annual daily traffic volume (AADT) is obtained by the formula

where N^m = the final value of AADT as a number for each type of motor vehicles/24 h; N^m = as in formula (6).

Determination of the traffic volume reduced to units of cars: The reduction of AADT to units of cars is made on the basis of the transfer coefficients shown in Table 3:

The determination of the average daily traffic volume reduced to car units is done by the formula:

where N^1 = AADT reduced to car units, number of car units/24 h; N_s = AADT of the s-type of motor vehicles (MV) as a number for each type of MV/24 h; K_s = the transfer coefficient for the s-type of MV; S = the index of the type of MV (values from 1 to 7).

Determination of peak hour traffic volume: Peak hour traffic volume is the highest hour volume reached or overreached during t hours in the year. It is determined by the formula:

where N = the peak hour traffic volume, number of car units/h;

N_1 = as in formula (8);

α_i = the coefficient of peak hour volume which is determined for each counting post through the formula:

where N_i = the hour traffic volume for a given counting post (MCP) which is overreached during t hours in the year, as a total number of motor vehicles/hour; t = time in hours (accepts values 30, 50 and 100; when planning the development of the road network and the design of road sites, $t = 50$ h; the values 30 and 100 are used during special investigations; N_p = AADT determined for the corresponding counting post as a total number of motor vehicles/24 h.

ESTONIA

The Estonian national road network consists of 15, 394 kms of which 1190 kms are main roads (E 20 Tallinn-Narva, 199.5 km and E 67 Tallinn-Pärnu-Ikla 167.6 kms. There are 35 counting posts -- 21 on E 20 and 14 on E 67. The 1995 census included data from 32 counting posts. As there was no road census carried out in 1990, comparisons with 1995 are not possible. However, from 1994, the census programme was established with the following classification of vehicles: passenger cars, light goods vehicles, medium goods trucks, heavy goods trucks, road trains, motor buses and coaches. Up until 1996, only manual traffic censuses were in use. On main census points (6 on E roads) counting has been carried out 4 X 24 hours (1X 24 h per season) and on the other points 3 X 24 h (not in winter season). Average annual daily traffic has been calculated for other points on the basis of these main points.

NETHERLANDS

Multiple sources were used to collect the required data for the 1995 Census. Data for 1990 is not given in some cases because of the lack of comparability due to rerouting and renumbering of roads. E roads are divided into road sections, some of which are part of more than one E-road, thus some E road sections appear in the table more than once. In the Netherlands there is a system of permanent counting posts. Some of these posts collect data per day for the total amount of traffic and some collect data per hour in three categories (passenger cars, light goods vehicles and heavy goods vehicles). To convert these data into four categories we have organised some additional counts. Data is only included for four categories (A-D), because category E from the UN Recommendations represents a relatively small amount on the Dutch E road network and was difficult to measure. Motorways and expressways have been combined because it is difficult to distinguish between the two road types.

POLAND

A census was taken in 1995 of the traffic flow on the national road network in Poland and this included the census of motor traffic on main international arteries (E roads). The total length of E roads covered by the test facilities was 4496 km. Automatic counting was carried out at 525 counting posts and manual counting was carried out at 31 counting posts. In an effort to conserve resources, the year test cycle complying with the original Geneva formula was reduced to nine "day" periods and two "night" periods. The day period counts were performed from 8 00 to 16 00 (with some selected locations from 6 00 to 22 00) and night period counts from 22 00 to 6 00. Dates of traffic counts were chosen as to define the annual average daily traffic with the required accuracy. In the table shown below, the schedule for the 1995 traffic census is indicated.

Schedule of traffic census in 1995

Number of count	Data of counting	Day of week	Character of counting
x ₁	26 January	Thursday	day
x ₂	28 March	Tuesday	day
x ₃	24 May	Wednesday	day

x ₄	13 July	Thursday	day
x ₅	16 July	Sunday	day
x ₆	22 August	Tuesday	day
x ₇	27 August	Sunday	day
x ₈	27 September	Wednesday	day
x ₉	10 December	Sunday	day
x ₁₀	24/25 May	Wed. / Thurs.	night
x ₁₁	27/28 September	Wed. /Thurs.	night

Method used for calculation of daily averages:

$$AADT = \frac{M_R \times N_1 + 0,8 \times M_R \times N_2 + M_N \times N_3 + R_N}{N}$$

Where:

AADT = Annual Average Daily Traffic

M_R = average “day” traffic per workday

M_N = average “day” traffic per Sundays and holidays

R_N = average “night” traffic

N₁ = number of working days in year, N₁ = 250

N₂ = number of Saturdays and pre-holiday days, N₂ = 53

N₃ = number of Sundays and official holidays, N₃ = 62

$$M_R = \frac{1}{3} \left(\frac{x_1 + x_4}{2} + \frac{x_2 + x_6}{2} + \frac{x_3 + x_8}{2} \right)$$

$$M_N = \frac{1}{2} \left(\frac{x_5 + x_7}{2} + x_9 \right)$$

$$R_N = \frac{x_{10} + x_{11}}{2}$$

Where:

x₁, x₂x₉ = “day” traffic (6.00 - 22.00),

x₁₀, x₁₁ = “night” traffic (22.00 - 6.00) on the counting days in the Schedule of Traffic above.

PORTUGAL

Introduction

The 1995 traffic census was organized differently than it was in 1990. Four kinds of counting stations (principal and covering manual stations, automatic and toll stations) were considered in the counting system for 1995, whereas in 1990 only principal manual stations were considered. In 1995, in the principal stations, counting was carried out according to the UN Recommendations, except for night counting which was estimated. In the covering stations a simplified method was used based on five countings only during eight hours per day. In this case, the AADT was estimated by using sampling methods.

As a result of a new classification and of changes in some routes, the European roads in Portugal were grouped into three categories:

- Reference roads

E80 - Lisboa, Santarém, Leiria, Coimbra, Aveiro (Albergaria), Viseu, Guarda, C.Formosa (border with Spain);

E90 - Lisboa,...., Setúbal, Évora, Caia (border with Spain).

- Intermediate roads

E01 - Valença, Porto, Aveiro (Albergaria), Coimbra, Lisboa, Setúbal, Faro, Vila real de Santo António (border with Spain).

E82 - Porto, Vila Real, Bragança, Quintaniilha (border with Spain).

- Connecting roads

E801 - Coimbra, Viseu, Vila Real, Chaves, C.Verde Raia (border with Spain);

E802 - Bragança, Guarda, Castelo Branco, Portalegre, Évora, Beja, Ourique;

E805 - Famalicão, Chaves;

E806 - Torres Novas, Abrantes, Castelo Branco, Guarda.

Approximately 2319 kms, or 23 per cent of the national road system belong to the E road network (covered by Annex 1 of the European Agreement on Main International Traffic Arteries (AGR)). These roads have common sections on a total length of 596 kms, distributed as follows:

E01 coincides with E80 and E90 on lengths of 246 kms and 56 kms respectively;

E801 coincides with E805 on a length of 37 kms;

E802 coincides with E80, E82, E90, and E806 on lengths of 15kms, 38 kms, 41 kms and 162 kms respectively.

Counting Stations

In 1995 manual classified traffic counts were made along the national road network at 79 principal stations and 466 covering stations. Automatic counts were made at 59 stations and toll counts at 40 stations. On E roads, manual, automatic traffic counts and toll stations were

made at 94, 27 and 34 stations respectively. These were distributed as shown on the traffic map, where the total number of vehicles in both directions were recorded. There are 38 counting stations that simultaneously serve equal road sections, of which 13 correspond to manual counting, 6 to automatic counting and 19 to toll stations, and are distributed as follows:

- E01 has 15 and 6 stations in common with E80 and E90 respectively;
- E801 has 2 stations in common with E805;
- E802 has 1, 2, 3 and 9 stations in common with E80, E82, E90 and E806, respectively.

Counting Schedule

As in the earlier census, at principal stations, manual classified counts were made on 14 days of the year in accordance with the schedule defined by the United Nations, with the exception of night countings, which were not counted in 1995 (see Table 1). At covering stations manual counts were made on 5 days of the year, during 8 hours, as follows: period 12.00 - 20.00 on 4 working days and 13.00 - 21.00 on one Sunday (see Table II).

Table I: Principal manual stations

CODE	DATE	WEEKDAY
A	28 January	Sunday
B	6 March	Monday
C	8 April	Saturday
D	21 April	Friday
E	23 April	Sunday
F	18 May	Thursday
G	7 June	Wednesday
H	11 July	Tuesday
I	23 July	Sunday
J	8 August	Tuesday
K	16 September	Saturday
L	29 October	Sunday
M	9 November	Thursday
N	15 December	Friday

Table II - Covering manual stations

CODE	DATE	WEEKDAY
B	6 March	Monday
H	11 July	Tuesday
I	23 July	Sunday
J	8 August	Tuesday
M	9 November	Thursday

Annual Average Daily Traffic

On the basis of the figures recorded in the different traffic counts during the year, the annual average daily traffic was determined for each station. Using the codes in the above tables, the following formula was constructed to calculate the AADT at the principal manual stations:

$$\text{Daily AADT (16 hours)} = 1/28 (A+C+E+I+K+L) + 1/14 (D+G+F+H+J) + 1/7 (B+M+N)$$

AADT = Daily AADT x night factor (night factor was estimated based on automatic counting stations).

The AADT at the covering manual stations was estimated using sampling methods to extrapolate from AADT (8 hours) to AADT (16 hours). To estimate the AADT (24 hours) the night factor was used, based on automatic counting stations. Each E road was divided into several sections, each section belonging to a counting station. Based on the AADT at each station, and on the extent of the road system covered by that station, the corresponding vehicles x kilometres was determined. To determine the AADT for a given road and for a given category, the number of vehicles x kilometres was added up and then divided by the total length. The national AADT was found in the same way.

Some reduction in traffic related to 1990 was due to the following:

- Construction of new links of toll motorways (counting posts P22, P23, P26, P27, P40, P89, P90, P92);
- Construction of motorways without toll but further away from urban centres (counting posts P49, ..., P55A);
- Construction of by-passed to urban centres (counting posts P5, P41A);
- Taking new stations into consideration, traffic is measured from unequal points (counting posts P10, P44A, P116A, P116B, P118A).

These results affect some variations between 1995 and 1990 (as shown in table 4), especially E01, E80 and E90. Consequently, the total variations of the above-mentioned roads did not grow as much as was hoped for.

ROMANIA

Waiting for translation from French to English.

SWITZERLAND

Waiting for translation from French to English.

THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA (FYROM)

Introduction

The road traffic census for 1995 in FYROM was made at 22 counting places: 8 places by hand counting, 11 places with automatic counters and for 3 places data from toll stations were used. The locations of the counting places were specified according to the AGR. In this counting and for future research the sign MK will be used for determination of counting places.

Organization and calculation of traffic inventory

The Inventory is collected by hand counting, automatic counters and data from toll stations.

**TABLE
OF THE ADDITIONAL COUNTING ON “E” ROADS TO OBTAIN
TRAFFIC STRUCTURE WHERE THERE ARE AUTOMATIC COUNTERS OR
TOLL STATIONS IN 1995**

Counting code time	Date	Day	Counting hour (from - to)
D	February, 20	Monday	06 - 08
E	May, 14	Sunday	20 - 22
F	June, 08	Thursday	13 - 15
G	July, 19	Wednesday	11 - 13
J	August, 29	Tuesday	08 - 11
K	September, 16	Saturday	15 - 18
N	December, 22	Friday	15 - 18
NB	February, 20	Monday	22 - 24
NG	July, 20	Thursday	00 - 03
NK	September, 17	Sunday	03 - 06

The hand counting was performed by JP “Makedonijapat” - Skopje with staff trained for this counting and the hand counting was verified daily by the Institute of Statistics staff.

-Automatic counters: Permanent counting of the traffic by automatic counters was done at 11 counting places. There are two types of automatic counters on the roads in former Yugoslav Republic of Macedonia. The first type does not indicate classification during the counting, while the second type classifies by heavy (longer than 6m) and light (shorter than 6m). The record is made on tape for every hour of the day. To be able to specify the traffic structure there was 10-day additional hand counting at these counting places.

**TABLE
OF HAND TRAFFIC COUNTING ON THE NATIONAL AND REGIONAL
ROADS DURING 1995**

Day counting				Night counting			
Day code	Date	Day	Time	Night code	Date	Day	Time

I. Table of traffic counting days on counting places with 5 day traffic counting

C	March	18	Saturday	06-22	-	-	-	-
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D	April	14	Friday	06-22	ND	April, 14/15	Fri/Sat	22-06
G	July	15	Wednesday	06-22	NB	July, 15/16	Wed/Thurs	22-06
I	August	6	Sunday	06-22	NI	August, 6/7	Sun/Mon	22-06
M	November, 02		Thursday	06-22	-	-	-	-

II. Counting places where there is counting only one day in the year:

G	July 05		Wednesday	06-22	NB	July, 5/6	Wed/Thurs	22-06
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III. Data from toll stations:

Data on tickets sold at toll stations (up to 4 vehicle categories) was used and adapted for the number of toll-free vehicles. To determine the traffic structure there was 10-day hand counting at the toll stations according to the table for automatic counters.

Vehicle classification:

The vehicle classification was made in 10 categories:

1. bicycles on pedals with and without motor;
2. motorcycles, scooters and motor tricycles;
3. cars with and without trailer including caravans with no more than 9 seats including the driver's seat;
4. - buses with and without trailer;
5. - animal carts;
6. - light freight vehicles with carrying capacity to 3,5 tons;
7. - freight vehicles, carrying capacity from 3,5 - 7 tons without trailer;
8. - freight vehicles, carrying capacity over 7 tons with and without trailer;
9. - tractors with and without trailer or semi-trailer;
10. - special vehicles (including construction machinery and tanks).

Calculation

Average annual daily traffic (AADT):

1. AADT from hand counting was calculated by the following formula:
2. AADT from automatic counters is calculated dividing the total vehicle number by the number of work days of the counter.
3. AADT from toll stations is calculated dividing the total vehicle number by 365 days. AADT for every E road is calculated adding AADT from every counting place on that road and dividing that number by the total number of counting places on that road.

Table 4. the average night traffic at the counting places is calculated by dividing the total traffic between 22.00 and 6.00 with the number of days for which there is data. The average number of vehicles per counting place during holidays is calculated by dividing the 24-hour traffic for two months (July and August) with the number of days in these two months for

which there is data. The average number for traffic jams is calculated as maximum one hour traffic at 15.00.

The classification of the traffic was made as follows:

1. - sum of light + heavy motor vehicles

1.1. light motor traffic (A+B+E)

1.2. - heavy motor vehicles (C+D)

There is no comparison in Table 4 as this data was not available since 1990.

It should be noted that a great decrease in traffic is due to the closure of the borders towards North and South in 1995, thus these data would not be expected to accurately express the maximum traffic density in the country.

UKRAINE

(Waiting for translation from Russian to English)
