

**Economic and Social
Council**Distr.
GENERALTRANS/WP.6/AC.5/2005/11
18 November 2005

ENGLISH ONLY

ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

Working Party on Transport StatisticsWorkshop on statistics on the volume of road traffic (vehicle-kilometres)

(Copenhagen, 1-2 December 2005)

Method for Estimating the Volume of Road Traffic in SloveniaTransmitted by the Statistical Office of the Republic of Slovenia

The basis for calculating road traffic data on the territory of Slovenia is counting of vehicles on State roads, which is done by the Directorate of the Republic Slovenia for Roads (DRSR) at the Ministry for Transport. The calculation of vehicle kilometres on the entire road network of Slovenia is done by the company OMEGAconsult by the order of the DRSR. The data are primarily intended for the International Road Traffic and Accidents Database (IRTAD) managed by the Joint OECD/ECMT¹ Transport Research Centre. These data are used as the official estimate by the Statistical Office of Republic of Slovenia (SORS). In the continuation of this paper, the methodology of counting traffic on State roads and the methodology of grossing up the volume of road traffic on the whole road network will be explained.

At the present time, no other source is available for calculating this sort of data. The partial information can be obtained from the survey on road transport of goods and the survey on road public transport of passengers. The data from the kilometre recorder are not obtained at the yearly inspection of vehicles and will be difficult to include in the future.

Currently, the official agreement between the Statistical Office of the Republic of Slovenia and the Directorate of the Republic of Slovenia for Roads for the use of these data has not yet been achieved. Nevertheless, the Statistical Office can publish the data, but the detailed

¹ OECD - Organisation for Economic Co-operation and Development; ECMT - European Conference of Ministers of Transport

methodology regarding the calculation of vehicle kilometres is not available and will be presented in this paper only in general.

Counting of traffic on state roads in Slovenia

Systematic collection of data on traffic on the State road network in Slovenia started as early as 1954 and it is done by the Directorate of the Republic of Slovenia for Roads (DRSR) at the Ministry for Transport. Since then, the extent of data collection has been subject to modifications due to construction of the road network, growth of road traffic and needs for data on road traffic.

The whole State road network in Slovenia is divided into 945 road sections. A counting point is appointed to each section in a way to present as best as it can the traffic flow of the whole section. Counting points are divided into:

- 326 automatic counting points
- 232 manual counting points
- 387 estimated counting points.

Traffic flows on estimated counting points are taken over from neighbouring road sections and corrected according to some additional characteristics (e.g. junctions and built-up areas on road sections).

Table 1: Length of roads and number of counting points by type of roads (2003)

Type of road	Total length of roads (km)	Total number of counting points	Number of counting points per 10 km	Number of manual and automatic counting points	Number of manual and automatic counting points per 10 km
Motorways	559	101	1,81	57	1,02
Main roads	972	166	1,71	59	0,61
Regional roads	4810	678	1,41	442	0,92
Total - State roads	6348	945	1,49	558	0,88

Source: DRRS

The main purpose of counting is to gain information on traffic flows on individual road sections. It is shown as Average Annual Daily Traffic (AADT).

Vehicle kilometres are obtained by multiplying the number of vehicles counted on the counting points (AADT) with the length of the road section. The total amount can be further divided with information from automatic and manual counting:

- by type of vehicle (passenger cars, motorcycles, buses, light trucks, heavy trucks and road tractors) and
- by country of registration (domestic vehicles, foreign vehicles).

Table 2: Million vehicle kilometres made on state roads in Slovenia (2003)

		Type of road			
		Motorways	Main roads	Regional roads	All state roads
Passenger cars	All	2,902.7	2,441.1	3,574.5	8,918.2
	Domestic	2,511.4	2,169.6	3,415.2	8,096.2
Motorcycles	All	8.2	14.0	24.3	46.5
	Domestic	5.3	10.5	21.2	36.9
Busses	All	27.0	24.1	36.4	87.5
	Domestic	18.7	19.8	34.7	73.1
Light trucks	All	285.6	193.8	255.9	735.3
	Domestic	262.4	178.6	250.9	691.9
Heavy trucks and road tractors	All	272.4	148.7	98.1	519.2
	Domestic	179.7	105.4	90.9	376.0
All vehicles	All	3,495.9	2,821.7	3,989.2	10,306.7
	Domestic	2,977.5	2,483.9	3,812.9	9,274.1

The current system has some shortcomings which have to be pointed out and will be dealt with in the future. Firstly, counting on entry and exit lanes is not included. The share of length of exit and entry lanes in the total State road network is around 2%. Secondly, counting points are mostly located outside urban areas, which underestimates the volume of traffic on the whole section. And finally, traffic on estimated counting points is obtained individually with the help of traffic flows on nearby sections and no fixed model is used.

At the moment, the final stage of establishing the National Road Traffic Model is under way. Information from this model will help to improve some problems with the current system of counting vehicles. Thus, manual counting points could be eliminated and separation of vehicles on domestic and foreign would be done with the help of this model. Also, by using the National Traffic Model and periodical counting (e.g. every 3 years), traffic on estimated counting points would be assessed in a more uniform way. In the future, the possibility of additional divisions of road sections is not excluded. If anything, the separation of sections in urban area from other sections would be fairly reasonable.

Vehicle kilometres on the entire road network

The entire road network in Slovenia consists of 6,348 kilometres of State roads and 32,059 kilometres of other communal roads. The calculation of vehicle kilometres covered by both domestic and foreign road motor vehicles on the entire road network of Slovenia is done by the company OMEGAconsult by the order of the Directorate of the Republic Slovenia for Roads. The data are primarily intended for the International Road Traffic and Accidents Database (IRTAD) managed by the Joint OECD/ECMT Transport Research Centre.

The data are given by expert valuation based on the following data sources:

- Data on the length of road sections by category of roads and location (inside and outside of built-up areas) (Database of Road Data)
- Annual average daily traffic (AADT) by sections of State roads (Directorate of the Republic Slovenia for Roads)
- AADT by sections of roads in built-up areas (partial results of road traffic studies)
- Data on registered vehicles (Ministry of the Interior)
- Data on the sale of fuel (Statistical Office of the Republic of Slovenia)
- Data on travelling to work and school (Census 2002 - SORS)
- Results of other traffic studies and studies of traffic safety in Slovenia

The volume of road traffic is further divided:

(I) by type of road:

- I-(a) all public roads,
- I-(b) roads inside urban areas,
- I-(c) roads outside urban areas,
- I-(d) country roads,
- I-(e) motorways,
- I-(f) A-level roads outside urban areas,
- I-(g) other roads outside urban areas;

(II) by type of vehicle:

- II-(a) all vehicles,
- II-(b) mopeds,
- II-(c) motorcycles and scooters,
- II-(d) motorized two-wheelers,
- II-(e) personal cars and station wagons,
- II-(f) goods motor vehicles,
- II-(g) buses.

In the first step, the total amount of vehicle kilometres on public roads in Slovenia is estimated. The basis for this estimation is an “Aggregate model of traffic work on public roads in Slovenia” (1995-2004) with information on the AADT on the State road network, sold fuel and registered vehicles as the basic data source.

In the second step, a different model is used for dividing traffic by categories of roads. With partial information from traffic studies, the traffic inside built-up areas is estimated by category of roads and by type and size of settlements. The structure of traffic on roads, the length of the road network by categories, AADT for State road and sale of fuel is used in this step.

In the third step, the results from the first two steps are combined and some fine tunings of the models are performed. If the figures vary significantly, the models are adjusted. So far very rare adjustments were necessary.

Table 3: Million vehicle kilometres made on public roads in Slovenia (2003)

		Million vehicle kilometres
By type of road	Total	14,526
	Inside urban areas	3,327
	Outside urban areas	11,199
	Country roads	8,480
	Motorways	2,719
	A-level roads outside urban areas	2,122
	Other roads outside urban areas	6,358
By type of vehicle	Total	14,526
	Mopeds	-
	Motorcycles and scooters	88
	Motorized two-wheelers	-
	Passenger cars and station wagons	13,007

Passenger kilometres on the entire road network

Passenger kilometres are also calculated for the purpose of the International Road Traffic and Accidents Database (IRTAD). They are presented within the modal split where a share of transport by private cars, buses and rail is shown.

The data are given by expert valuation based on different sources:

- Data on vehicle kilometres
- Data on travelling to work and school (Census 2002 - SORS)
- Results of other traffic studies (e.g. costs of transport)

Table 4: Million passenger kilometres made on public roads in Slovenia – modal split (2000-2003)

	2000	2001	2002	2003
Passenger cars and station wagons	19,357	20,001	20,667	21,331
Public transportation	3,127	3,231	3,339	3,446
Railway transport	705	715	749	777