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DEVELOPMENT OF A EUROPEAN TRANSPORT DATABASE SYSTEM

**TRANS-EUROPEAN NORTH-SOUTH MOTORWAY (TEM) AND
TRANS-EUROPEAN RAILWAY (TER) DATABASES**

Note by the secretariat

BACKGROUND

At its sixteenth session, the Working Party learned about the progress made in the development of the TEM and TER databases, and of other activities undertaken by the UNECE on the design and implementation of a European Transport Database System (TDS).

With a view to identifying data needs that could develop its activities concerning the coherence of the European Transport System in the future, the Working Party asked the secretariat to report on the progress made in the development of these transport database systems (TRANS/WP.5/34, para. 39). Following this request, the secretariat has produced this note.

I. Status report on the Trans-European North-South Motorway (TEM) Project Database

The data collection and processing activities of the TEM Project started from its outset in 1977. For many years, it has been limited to basic data on the status of the TEM motorway network and the TEM Corridor, consisting of existing road links to be replaced by the TEM motorways in the future.

In the framework of the expanded Project activities in mid-1980(s), the need arose to collect additional data on principal geometric parameters of these links and, therefore, two databases (TEMSTAT 1 and TEMSTAT 2) were established. TEMSTAT 1 reflects the status of the existing and future TEM motorway network, while TEMSTAT 2 presents the status of the national road system, fulfilling the function of missing connections as well as of the remaining E-road (AGR) and TINA links.

In these databases, the following data are being stored at the TEM Project Central Office (PCO) in Warsaw:

- motorway/road number (international/national)
- lengths of sections (in operation, under construction, planned)
- number of carriageways/lanes
- lane and shoulder widths
- maximum longitudinal gradient
- lengths within built-up areas
- lengths of road having design speed less than 60 km/h
- lengths of missing climbing lanes
- lengths of bridges with bearing capacity less than 60 T
- number of at-level railway crossings
- number of underpasses with clearance less than 4.5 m
- estimated travel times (cars, trucks)
- traffic volumes (AADT) according to the last census (split into trucks and other vehicles).

The data collection and processing is based on the uniform reference system, consisting of sections, subsections and portions of subsections.

The examples of the TEMSTAT 1 and 2 data collection forms were attached to the report submitted to the fifty-second meeting of the Working Party held on 14-16 November 2001 (document TRANS/WP.6/2001/11).

On the basis of the decision of the twenty-sixth session of the TEM Steering Committee (25-27 November 1996, Geneva), the extended TEMSTAT data collection commenced in 1997. Data thus obtained are being processed and analysed by the Project Central Office in Warsaw. The twenty-eighth session of the Steering Committee (22-26 November 1997, Geneva) further decided that the TEMSTAT forms, together with the reference system, would be revised and updated annually and that a special coordination meeting of experts responsible for data supply would be convened every year.

In accordance with this decision, the TEMSTAT Coordination and Training meetings were held in Istanbul, Turkey (25-27 March 1998), in Prague, Czech Republic (30 March-1 April 1998), in Vilnius, Lithuania (7-9 April 1999), in Budapest, Hungary on 17-19 April 2000, on 18-20 April 2001, on 8-9 April 2002 and on 19-21 May 2003 and in Prague on 18-19 March 2004. The latest meeting was held on 7-8 March 2005 also in Prague.

At these meetings, the problems related to the TEMSTAT data collection and processing, to the reference system and mapping were discussed and clarified on a country-by-country basis.

As from 1999, data on the status of the network as of 1 January each year are communicated to the TEM PCO by contact persons from the 13 participating countries electronically. This information is also used to describe the annual status of the TEM network (see annex 1).

As regards the TEMSTAT maps, the TEM PCO is in a position to produce these basic types of maps in the ArcView format:

- maps showing the present status of the TEM corridor and main (AGR, TINA) road network in the TEM region
- maps showing the existing (in operation) and future (under construction, in design stage, planned) motorway network in the chosen time horizons
- maps showing the present or forecasted traffic flows in the chosen time horizons.

All these maps cover either the whole TEM region, separate member countries or selected areas (e.g. vicinity of a big city or industrial agglomeration).

As from the year 2000 annually, on the basis of the data transferred by the member countries, the separate TEMSTAT road/motorway infrastructure maps of all TEM member countries mostly on the scale 1:750000 were launched by the TEM PCO and made available to the member countries in hard and electronic copies. By integration of individual TEMSTAT country maps, the map of the whole TEM region is also being produced.

Furthermore, as from the end of 2002, the TEMSTAT data transferred electronically by the member countries and processed by the TEM PCO are being interactively linked to the TEM mapping system, making it possible to introduce the reported annual infrastructure changes to the respective maps automatically and thus having transformed the TEMSTAT mapping system to the full-fledged GIS one.

Within the framework of the cooperation of the TEM PCO with the Western European Road Directors (WERD), transformed in 2003 to the Conference of European Directors of Roads (CEDR), its representatives participate regularly in the above-mentioned annual TEMSTAT meetings with the aim of harmonizing road and motorway data collection and processing procedures, reference and mapping systems of the newly acceded Central European countries with those of the European Union.

Furthermore, in accordance with the TEM Programme of Work for the years 2001-2004, constituting an integral part of the TEM Co-operation Trust Fund Agreement, the elaboration of the TEM Master Plan commenced in September 2003. This activity was also included in the Short-term Strategy for Further Integration of TEM in New European Transport Environment, approved by the thirty-sixth session of the Steering Committee held at Geneva on 4-6 December 2001, representing one of its most important outcomes.

At its thirty-ninth session which took place at Geneva, Switzerland on 26-28 May 2003, the Steering Committee approved the revised Terms of Reference, elaborated by the UNECE Transport Division and decided that the Master Plan had to be finished in 2004. These terms took into account the limited funds available, contained altogether 10 Work Packages (WP) and two options - the complete one covering also 8 non TEM countries and the limited one dealing with the TEM member countries only, from which the first one was selected. Regarding the organization and execution of works, the establishment of the Co-ordination and Experts groups, meeting four times and twice during the project period, respectively, has been approved

The Steering Committee (SC) also gave a mandate to the Master Plan Coordination Group (Director and/or Regional Adviser of the UNECE Transport Division, TEM Project Manager and his Deputy, External Consultants) to start the work as soon as possible and to apply a flexible approach, reflecting the real situations encountered, understanding that the SC will be kept informed about the decisions taken and progress reached.

The draft TEM Master Plan document was finished and its main findings and conclusions were submitted to the forty-second TEM Steering Committee session held on 29 November-1 December 2004 in Geneva for examination and decision on further steps to be taken. Following the detailed discussion, the presented draft Master Plan report was endorsed. To the most important outputs of this document belong the evaluation of 320 TEM projects based on multi-criteria methodology and elaboration of the set of 30 TEM Master Plan maps, with some of them covering all 21 countries involved. The final TEM Master Plan report was launched in 2005.

The elaboration of the TEM Master Plan resulted in the need for additional data collection necessary for priority projects' identification and evaluation in line with the approved evaluation methodology, elaborated by the external consultants.

In accordance with the approved TEM Master Plan TORs, the detailed traffic forecasting procedure consisting of two main steps was provided. In the first step, transformation of the UNECE 2000 AGR census of motor traffic on main international traffic arteries (E-roads) was adjusted to the uniform Master Plan mapping reference system. In the second step, the transformed and analysed traffic volumes for 2005, 2010, 2015 and 2020, taking into account the GDP growth, were computed for all vehicles and for trucks and coaches separately.

The attached tables (annexes 2-3) demonstrate the traffic forecasting methodology in one of the TEM member countries selected by chance.

II. Status report on the development of Trans-European Railway (TER) database

During 2004, TER PCO continued to collect data on the TER network particularly in relation to the implementation of the TER Master Plan. In relation to the implementation of this task, PCO commissioned the works of preparing maps to an external consultant.

These were produced in layers for various TER needs, and maps were created as well as other documents required by the implementation of TER Master Plan.

It continued the collection and correction of data referring to border crossings in the TER countries in accordance with the decisions taken by the Steering Committee sessions or meetings of experts in this field. The maps produced for border crossings with tables containing data were used during the UNECE-TER and Central European Initiative (CEI) Seminar which took place in Portoroz, Slovenia on 24-25 November 2004, during the CEI Summit Economic Forum.

<p>Note: The tables on pages 6-10 will be in English only.</p>

Annex 1

UNECE TEM Project Central Office Warsaw, Poland

1. STATUS OF TEM NETWORK (as of 1.01.2004)

COUNTRY	Total length	PROGRAMMED (in study, preliminary design and design phases)		UNDER CONSTRUCTION		IN OPERATION		COMPARATIVE INDICATORS		
	km	one carriage-way	both carriage-ways	one carriage-way	both carriage-ways	one carriage-way	both carriage-ways	% of total TEM length	CONSTRUCTION PROGRESS (% of length under construction)	DEGREE OF COMPLETION (% of length in operation)
Column No.	1	2	3	4	5	6	7	8	9	10
AUSTRIA	485	19	36	16	-	35	414	2.1	1.6	89.0
BOSNIA and HERZEGOVINA	331	-	319	-	-	-	12	1.4	-	3.6
BULGARIA	925	-	617	-	15	19	274	3.9	1.6	30.7
CROATIA	1,465	311	564	36	257	101	420	6.3	18.8	32.1
CZECH REPUBLIC	987	-	414	8	30	8	535	4.2	3.4	54.6
GEORGIA	1,053	-	1,045	-	-	-	8	4.5	-	0.8
HUNGARY	1,658	653	377	20	52	34	522	7.1	3.7	32.5
ITALY	1,519	-	-	-	4	-	1,515	6.5	0.3	99.7
LITHUANIA	731	204	12	-	-	254	466	3.1	-	81.1
POLAND	3,383	425	2,247	-	83	86	542	14.4	2.5	17.3
ROMANIA	2,983	-	2,735	-	134	-	114	12.8	4.5	3.8
SLOVAKIA	948	-	487	23	77	588	348	4.1	9.5	68.6
TURKEY	6,921	-	378	-	321	3,954	2,268	29.6	4.6	61.3
TOTAL	23,389	1,612	9,231	103	973	5,079	7,438	100.00	4.4	42.7

Annex 2

CONVERSION OF THE 2000 UNECE MOTOR TRAFFIC CENSUS TO THE TEM NETWORK REFERENCE SYSTEM

COUNTRY: AUSTRIA

No. of TEM section	From	To	Length of TEM section	AGR counting post number	Length of AGR counting section	Adjusted length of AGR section	Average AGR traffic	AGR % of heavy vehicles	Average (weighted) TEM traffic	TEM % of heavy vehicles (weighted)	TEM No. of heavy vehicles
A 01-01	Nickelsdorf (H/A)	Fischamend	47	4.A 4	17,20	17	29557	9,1	23113,4	9,4	2175,7
				5.A 4	4,40	4	26737	9,9			
				7.A 4	14,33	14	15686	9,7			
				9.A 4	3,33	3	25567				
				6.A 4	7,68	8	19401				
					46,94	47					
A 01-02	Fischamend	Wien-Prater	19	901.A 4	4,06	4	81643	8,8	58232,8	8,0	4669,1
				1.A 4	3,64	4	63960	8,9			
				2.A 4	5,26	5	60304	6,6			
				3.A 4	5,89	6	36707	8,2			
					18,85	19					
A 01-03	Wien-Prater	Wien-Inzersdorf	10	1.A 2	2,58	2	139332	7,8	122483,7	7,6	9259,4
				2.A 2	10,39	8	118300	7,5			
					12,97	10					
A 01-04	Wien-Inzersdorf	Seebenstein	55	3.A 2	6,08	6	85728	8,4	55270,9	10,0	5553,1
				34.A 2	8,41	9	64748	9,3			
				4.A 2	14,89	15	56895	11,2			
				26.A 2	2,35	2	57155	10,2			
				5.A 2	10,62	11	52006	10,2			
				6.A 2	11,57	12	32901	9,8			
					53,92	55					
A 01-05	Seebenstein	Ilz-Furstenfeld	82	7.A 2	26,59	31	28629	11,3	26643,8	12,2	3250,9

No. of TEM section	From	To	Length of TEM section	AGR counting post number	Length of AGR counting section	Adjusted length of AGR section	Average AGR traffic	AGR % of heavy vehicles	Average (weighted) TEM traffic	TEM % of heavy vehicles (weighted)	TEM No. of heavy vehicles
				8.A 2	16,14	19	24550	11,6			
				9.A 2	4,32	5	25686	12,5			
				10.A 2	23,15	27	26002	13,6			
					70,20	82					
A 01-06	Ilz-Furstenfeld	Gleisdorf West	22	11.A 2	18,51	22	29079	12,7	29079,0	12,7	3693,0
					18,51	22					
A 01-07	Gleisdorf West	Graz West	25	12.A 2	11,71	10	48507	10,8	49177,3	11,2	5517,9
				13.A 2	10,53	9	49418	11,4			
				17.A 2	6,32	6	50018	11,7			
					28,56	25					
A 01-08	Graz West	Mooskirchen	14	18.A 2	6,53	6	25610	12,3	31952,5	11,3	3617,5
				14.A 2	7,78	8	37276	10,5			
					14,31	14					
A 01-09	Mooskirchen	Modriach	24	15.A 2	23,84	24	16713	13,9	16713,0	13,9	2323,1
					23,84	24					
A 01-10	Modriach	Bad St. Leonhard	17	16.A 2	17,40	17	16118	14,4	16118,0	14,4	2321,0
					17,40	17					
A 01-11	Bad St. Leonhard	Wolfsberg Nord	11	27.A 2	11,12	11	16459	14,6	16459,0	14,6	2403,0
					11,12	11					
A 01-12	Wolfsberg Nord	Volkermarkt West	37	30.A 2	10,76	11	19489	13,2	20128,2	13,6	2742,5
				29.A 2	13,58	14	21163	13,5			
				28.A 2	9,29	9	19838	14,3			
				39.A 2	3,16	3	18711				
					36,79	37					

No. of TEM section	From	To	Length of TEM section	AGR counting post number	Length of AGR counting section	Adjusted length of AGR section	Average AGR traffic	AGR % of heavy vehicles	Average (weighted) TEM traffic	TEM % of heavy vehicles (weighted)	TEM No. of heavy vehicles
A 01-13	Volkermarkt West	Klagenfurt East	18	42.A 2	8,36	8	21431		21358,2		
				41.A 2	9,79	10	21296				
					18,15	18					
A 01-14	Klagenfurt East	Villach	40	32.A 2	3,30	3	24645	12,7	28167,4	12,4	3483,8
				22.A 2	10,10	10	32184	12,3			
				21.A 2	13,38	13	33332	11,2			
				31.A 2	6,26	6	20761	14,8			
				38.A 2	3,62	4	19497				
				37.A 2	3,11	3	21642				
					39,77	40					
A 01-15	Villach	Arnoldstein (A/I)	25	23.A 2	2,60	3	26907	15,4	19760,7	19,1	3772,7
				25.A 2	18,90	19	19909	19,6			
				40.A 2	3,86	4	14221				
					25,36	25					
A 02-01	Berg (SK/A)	Fischamend	36	2. 9	18,48	19	8314	5,2	8285,1	4,9	402,0
				6. 9	5,31	5	10151	5,7			
				4. 9	9,50	10	7815	2,7			
				5. 9	2,54	3	5933	8,6			
					35,83	36					

Annex 3

SUMMARY OF TRAFFIC FORECASTING ON TEM NETWORK

Country: **AUSTRIA**

TEM SECTION NO.	TERRAIN ^{*/}	2000 BASIS						2005 FORECAST		2010 FORECAST		2015 FORECAST		2020 FORECAST					
		AGR		TEN-STAC		COUNTRY		COUNTRY		COUNTRY		COUNTRY		AGR/GDP BASED		TEN-STAC		COUNTRY	
		AADT	T&C	AADT	T&C	AADT a/	T&C a/	AADT	T&C	AADT	T&C	AADT	T&C	AADT	T&C	AADT	T&C	AADT	T&C
01-01-00	F	23113	2176			28188	3065							34901	3286				
01-02-00	F	58233	4669			61519	4953							87932	7050				
01-03-00	F	122484	9259			191933	14058	b/	b/	b/	b/	b/	b/	184951	b/ 13981	b/	b/	b/	b/
01-04-00	F	55271	5553			60745	6627							83459	8385				
01-05-00	H	26644	3251			26837	4060							40232	4909				
01-06-00	H	29079	3693			29892	4230							43909	5576				
01-07-00	F	49177	5518			51026	6230							74257	8332				
01-08-00	F	31953	3618			38002	3843							48249	5463				
01-09-00	M	16713	2323			17105	2729							25237	3508				
01-10-00	M	16118	2321			16550	2776							24338	3505				
01-11-00	H	16459	2403			16943	2953							24853	3629				
01-12-00	F	20128	2743			20224	2910							30393	4142				
01-13-00	F	21358				22523	4028							32251					
01-14-00	F	28167	3484	33452	3786	32871	4272							42532	5261	37384	4928		
01-15-00	H	19761	3773			20594	4539							29839	5697				
02-01-00	F	8285	402											12510	607				

* / TERRAIN: F – flat, H – hilly, M – mountainous

a / 2001 values

b / will be replaced by S1 (Vienna Outer Ring Expressway)
