



**Economic and Social
Council**

Distr.
GENERAL

TRANS/WP.6/2005/5
18 February 2005

Original: ENGLISH

ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

Working Party on Transport Statistics
(Fifty-sixth session, 8-10 June 2005)

STATUS REPORT ON THE DEVELOPMENT OF THE TEM DATABASE

Note by the secretariat

This document is based on the Report provided by the Project Central Office (PCO) of the Trans-European North-South Motorway (TEM) Project about the progress made in the development of the database (TRANS/WP.6/147, para. 26).

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TRANSPORT DATABASE AND INFORMATION SYSTEMS DEVELOPMENT

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

1. 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.

2. In the framework of the expanded Project activities in the mid-eighties, 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.

3. 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.

4. 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).

5. 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 co-ordination meeting of experts responsible for data supply would be convened every year.

6. 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 last meeting was held on 7-8 March 2005 also in Prague, Czech Republic.

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

8. 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).

9. 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, and
- 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).

10. 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 are 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.

11. 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.

12. Within the framework of the co-operation of the TEM PCO with the WERD (Western European Road Directors), transformed in 2003 to CEDR (Conference of European Directors of Roads), 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.

13. 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.

14. 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 the year 2004. The TOR took into account the limited funds available, containing 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.

15. 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.

16. 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 the 21 countries involved. The final TEM Master Plan report will be launched in the first half of year 2005.

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

18. In accordance with the approved TEM Master Plan TOR's, 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 a uniform Master Plan mapping reference system. In the second step, the transformed and analyzed traffic volumes for the years 2005, 2010, 2015 and 2020, taking into account the GDP growth, were computed for all vehicles and for trucks and coaches separately.

19. The attached tables (Annexes 2-3) demonstrate the traffic forecasting methodology in one of the TEM member countries selected at random.



TEM Project Central Office
UNECE Warsaw, Poland

Annex 1
(English Only)

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 carriageway | both carriage-ways | one carriageway | both carriage-ways | one carriageway | 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 | 1465 | 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 | 1053 | - | 1045 | - | - | - | 8 | 4.5 | - | 0.8 |
| HUNGARY | 1658 | 653 | 377 | 20 | 52 | 34 | 522 | 7.1 | 3.7 | 32.5 |
| ITALY | 1519 | - | - | - | 4 | - | 1515 | 6.5 | 0.3 | 99.7 |
| LITHUANIA | 731 | 204 | 12 | - | - | 254 | 466 | 3.1 | - | 81.1 |
| POLAND | 3383 | 425 | 2247 | - | 83 | 86 | 542 | 14.4 | 2.5 | 17.3 |
| ROMANIA | 2983 | - | 2735 | - | 134 | - | 114 | 12.8 | 4.5 | 3.8 |
| SLOVAKIA | 948 | - | 487 | 23 | 77 | 588 | 348 | 4.1 | 9.5 | 68.6 |
| TURKEY | 6921 | - | 378 | - | 321 | 3954 | 2268 | 29.6 | 4.6 | 61.3 |
| TOTAL | 23389 | 1612 | 9231 | 103 | 973 | 5079 | 7438 | 100.00 | 4.4 | 42.7 |

Annex 2

(English only)

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 |

| 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 |
|--------------------|-----------------|-----------------|-----------------------|--------------------------|--------------------------------|--------------------------------|---------------------|-------------------------|--------------------------------|------------------------------------|---------------------------|
| | | | | 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 |
| | | | | 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 | | | |

| 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 |
|--------------------|------------------|------------------|-----------------------|--------------------------|--------------------------------|--------------------------------|---------------------|-------------------------|--------------------------------|------------------------------------|---------------------------|
| | | | | | 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 | | | | | |
| 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 | | | |

| 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 |
|--------------------|-------------|-------------------|-----------------------|--------------------------|--------------------------------|--------------------------------|---------------------|-------------------------|--------------------------------|------------------------------------|---------------------------|
| | | | | 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
(English Only)

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 | |
| | | AAD T | T&C | AAD T | T&C | AAD T a) | T&C a) | AAD T | T&C | AAD T | T&C | AAD T | T&C | AAD T | T&C | AAD T | T&C | AAD T | 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 | 12248 4 | 9259 | | | 19193 3 | 14058 | b) | b) | b) | b) | b) | b) | 184951 b) | 13981 b) | 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)

 = motorway (expressway) in operation