

TRANSPORT DATABASE AND INFORMATION SYSTEMS DEVELOPMENT

Status report on the Trans-European Railway Project (TER) Database

The Project Central Office of the Trans-European Railway Project (TER) wishes to inform the Working Party about the latest developments of the TER database and GIS system in the document presented below.

REPORT ON TER (TRANS-EUROPEAN RAILWAY) DATABASE AND GIS ACTIVITY

A. TER database

The TER Database is meant to cover all 16-member countries as well as several observer countries in TER (Annex 1). The aim of this database is to provide the necessary data for the preparation of pre-feasibility studies, assessment of investments, facilitation of railway border crossings, etc., for upgrading and modernization of the TER lines in the member countries.

At present TER Database is built for Access Database. The structure of the database was obtained from the Conceptual Data Model created using the tool Sybase Power Designer 8. The database has data for 12 countries. Until now data was updated for 9 countries. The reference year for operational data is 2001. The reporting application, which provide more than 70 reports will be develop further if it is requested.

The meeting of the Group of TER National Co-ordinators (Third Session, 23-24 January, 2003, Budapest, Hungary) on TER database issues proposed a new database structure (more application oriented) to be implemented in the future.

The list of the data fields of the TER database is presented in Annex 2.

The process to translate the data from the actual database structure into the new one will be done by TER-PCO.

The new structure of the TER Database contains four main groups of data:

1. Data for basic railway indicators and social information.
2. Data for infrastructure: line sections, bridges, tunnels, overpasses, and level crossings.
3. Operational data.
4. Data regarding transport equipment (cars, wagons, locomotives and railcars).

B. GIS mapping

For GIS Mapping System we are using in TER-PCO, MapInfo Professional version 6.

The maps offer the possibilities to view, analyze and print images and views for TER Border Crossing Stations, the TER / AGC / AGTC lines and their line sections as well as projects prepared for implementation and identified per corridors in various countries.

All these maps cover the whole TER region, separate member countries, selected areas, Pan-European corridors, etc.

The present GIS collection provides maps carried out in different analytical views that can be used for further data analysis.

The TER GIS maps are two dimensional, and can be grouped at present into the following:

1. TER member countries,
2. AGC, AGTC, TER lines,
3. TER network,
4. TER sections on the TER network,
5. TER border stations,
6. Projects for rehabilitation of the railway lines identified per corridors,
7. Pan-European corridors overlapping TER network.

All these maps were drawn on the basis of the information stored in the TER database (actual data).

For each country we provide a number of predefined workspaces, basic layers with GIS objects and data, and more than 30 predefined maps (thematic maps) also exported into graphical files. All of this GIS activity will be distributed to the inputting countries. The maps can be accessed using MapInfo Professional Version 6 or higher, MapInfo ProViewer Version 6.5 or other ESRI products (i.e. ArcView, ArcExplorer).

TER-PCO is developing a presentation of maps and data reports, which can be distributed to the countries. This is developed using Macromedia Flash. This solution will allow us to extend the TER web-site according to the decision of the countries using the work.

**TER doc.
Annex 1**

List of member and observer TER countries

| # | Abbr.2 | Abbr.3 | Short Name | Full Name | Status |
|----------|---------------|---------------|---------------------------|--|---------------|
| 1 | AT | AUT | AUSTRIA | Republic of Austria | Member |
| 2 | BA | BIH | BOSNIA and HERZEGOVINA | Bosnia and Herzegovina | Member |
| 3 | BG | BGR | BULGARIA | Republic of Bulgaria | Member |
| 4 | BY | BLR | BELARUS | Belarus | Observer |
| 5 | CZ | CZE | CZECH REPUBLIC | Czech Republic | Member |
| 6 | GE | GEO | GEORGIA | Georgia | Member |
| 7 | GR | GRC | GREECE | Hellenic Republic | Member |
| 8 | HR | HRV | CROATIA | Republic of Croatia | Member |
| 9 | HU | HUN | HUNGARY | Republic of Hungary | Member |
| 10 | IT | ITA | ITALY | Italian Republic | Member |
| 11 | LT | LTU | LITHUANIA | Republic of Lithuania | Member |
| 12 | LV | LVA | LATVIA | Republic of Latvia | Observer |
| 13 | MD | MDA | MOLDOVA | Republic of Moldova | Observer |
| 14 | MK | MKD | FYROM | THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA | Observer |
| 15 | PL | POL | POLAND | Republic of Poland | Member |
| 16 | RO | ROU | ROMANIA | Romania | Member |
| 17 | RU | RUS | RUSSIAN FEDERATION | Russian Federation | Member |
| 18 | SK | SVK | SLOVAKIA | Slovak Republic | Member |
| 19 | SL | SVN | SLOVENIA | Republic of Slovenia | Member |
| 20 | TR | TUR | TURKEY | Republic of Turkey | Member |
| 21 | UA | UKR | UKRAINE | Ukraine | Observer |

| Entity Category | Table Name | Field Name | No |
|-----------------|--------------------------|--|----|
| General | General data per Country | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | Total length of the rail network (Km) | 3 |
| | | Labour productivity: employees/km of network in use (Conventional Rail Transport) | 4 |
| | | Labour productivity: net ton-km + passenger-km/employee (Conventional Rail Transport) | 5 |
| | | Labour productivity: employees/km of network in use (High Speed Rail Transport) | 6 |
| | | Labour productivity: net ton-km + passenger-km/employee (High Speed Rail Transport) | 7 |
| | | Productivity of freight transport per km: gross ton-km/km of network | 8 |
| | | Productivity of freight transport per km: net ton-km/km of network | 9 |
| | | Productivity of freight transport per employee: gross ton-km /employee | 10 |
| | | Productivity of freight transport per employee: net ton-km/employee | 11 |
| | | Productivity of Passengers Transport per Year (passenger-km/employee) (Conventional Rail Transport) | 12 |
| | | Productivity of Passengers Transport per Year (passenger-km/km of network) (Conventional Rail Transport) | 13 |
| | | Productivity of Passenger Transport per Year (passenger-km/employee) (High Speed Rail Transport) | 14 |
| | | Productivity of Passenger Transport per Year (passenger-km/km of network) (High Speed Rail Transport) | 15 |
| | | Productivity of Locomotives: gross ton-km/locomotive | 16 |
| | | Productivity of Wagons: net ton-km/wagon | 17 |
| | | Productivity of lines (passenger train-km + freight train-km/km of network) | 18 |
| | | Energy consumption (for traction power): MJ/1000 gross ton-km | 19 |
| | | Total number of railway workers | 20 |

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Annex 2
List of database fields

page 2

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|-----------------|-------------------|---|----|
| Entity Category | Table Name | Field Name | No |
| Infrastructure | Line section File | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | Section code | 3 |
| | | Start Node Code | 4 |
| | | End Node Code | 5 |
| | | Railway Code | 6 |
| | | Main Location of the Start Node | 7 |
| | | Length of Line Section | 8 |
| | | Type of Line Section | 9 |
| | | Maximum Speed Allowed by the Track | 10 |
| | | Maximum Design Speed | 11 |
| | | Load Limits for Railway Lines | 12 |
| | | Number of Tracks | 13 |
| | | Distance between Axes of Tracks | 14 |
| | | Track Gauge | 15 |
| | | Loading Gauge | 16 |
| | | Rail Structure gauge | 17 |
| | | Traction System | 18 |
| | | Two-way Direction Operation | 19 |
| | | Type of signalling | 20 |
| | | Maximum Gradient | 21 |
| | | Minimum Radius of Curve | 22 |
| | | Maximum Capacity of Line Section | 23 |
| | | Authorised mass per axle wagons < 100 km/h | 24 |
| | | Authorised mass per axle wagons < 120 km/h | 25 |
| | | Construction year of the Line Section | 26 |
| | | Year of Last Main Overhaul of Line Section | 27 |
| | | Minimum Design Speed | 28 |
| | | Dominant Speed Speed | 29 |
| | | Percent of Double Track | 30 |
| | | Sleeper Type | 31 |
| | | Distance between Sleepers | 32 |
| | | Land Type | 33 |
| | | Type of fastening | 34 |
| | | Thickness of Ballast | 35 |
| | | Presignalling Distance | 36 |
| | | Connection between the Driver and the Dispatcher | 37 |

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List of database fields

| Entity Category | Table Name | Field Name | No |
|-----------------|-----------------------------------|--|----|
| Infrastructure | Operational Data of a Line | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | Line Section Code | 3 |
| | | Minimum Travel Time for Passenger Trains | 4 |
| | | Minimum Travel Time for Freight Trains | 5 |
| | | Number of Present Freight Train | 6 |
| | | Number of Present Passenger Train | 7 |
| | | Freight Net Load | 8 |
| | | Passenger - km per year | 9 |
| | | Passenger Gross Load | 10 |
| | | Freight Gross Load | 11 |
| | | Passenger Train Movements | 12 |
| | | Freight Train Movements | 13 |
| | | Passenger Trains Commercial Speed | 14 |
| | | Freight Trains Commercial Speed | 15 |
| | | Type of service | 16 |
| | | Frequency of service | 17 |
| Infrastructure | Nodes | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | Node Code | 3 |
| | | Node Type | 4 |
| | | Rail Code | 5 |
| | | Station type | 6 |
| | | Distance of the Node from the Main AGC or TER Line | 7 |
| | | Access to the station | 8 |
| | | Intermodal operation | 9 |
| | | System of traction on the Node | 10 |
| | | Average Waiting Time for Lorries | 11 |
| | | Minimum Main Track Length | 12 |
| | | Minimum Siding (Track) Length | 13 |
| | | Minimum (Main) Passenger Platform Length | 14 |
| | | Number of Tracks | 15 |
| | | Number of Passenger Tracks | 16 |
| | | Number of Freight Tracks | 17 |
| | | Number of Loading Tracks | 18 |
| | | Number of Sorting Tracks | 19 |
| | | Maximum Speed on Switches | 20 |
| | | Track Gauge | 21 |
| | | Change of Gauge | 22 |
| | | Construction year of the Node | 23 |
| | | Year of Last Main Overhaul of Node | 24 |

Annex 2

List of database fields

| Entity Category | Table Name | Field Name | No |
|-----------------|------------------------|--|----|
| Infrastructure | Bridges | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | Section Code | 3 |
| | | Location from the Start Node of the Line Section | 4 |
| | | Order Number of the parallel railway Structure | 5 |
| | | Length of Bridge | 6 |
| | | Number of Tracks | 7 |
| | | Loading Gauge | 8 |
| | | Rail Structure Gauge | 9 |
| | | Test Train | 10 |
| | | Construction year of the Bridge | 11 |
| | | Year of Last Main Reconstruction of Bridge | 12 |
| Infrastructure | Tunnels | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | Section Code | 3 |
| | | Location from the Start Node of the Line Section | 4 |
| | | Order Number of the parallel railway Structure | 5 |
| | | Length of the Tunnel | 6 |
| | | Number of Tracks | 7 |
| | | Loading Gauge | 8 |
| | | Rail Structure Gauge | 9 |
| | | Construction year of the Tunnel | 10 |
| | | Year of Last Main Reconstruction of Tunnel | 11 |
| Infrastructure | Overpasses | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | Section Code | 3 |
| | | Location from the Start Node of the Line Section | 4 |
| | | Order Number of the parallel railway Structure | 5 |
| | | Number of Tracks | 6 |
| | | Loading Gauge | 7 |
| | | Rail Structure Gauge | 8 |
| | | Construction year of the Overpass | 9 |
| | | Year of Last Main Reconstruction of Overpass | 10 |
| Infrastructure | Level Crossings | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | Section Code | 3 |
| | | Location from the Start Node of the Line Section | 4 |
| | | Number of Tracks | 5 |
| | | Type of Protection of Crossing | 6 |
| | | Construction Year of the Level Crossing | 7 |
| | | Year of Last Main Overhaul of Level Crossing | 8 |

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List of database fields

| Entity Category | Table Name | Field Name | No |
|-----------------|------------------------------------|--|----|
| Infrastructure | International Line Codes | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | Section Code | 3 |
| | | AGC, AGTC or TER | 4 |
| | | Order Number of the Section Line into Country | 5 |
| Infrastructure | Coded Lines Section | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | Section Code | 3 |
| | | Pan-European Corridor Code | 4 |
| | | Order Number of the Section Line in to Country | 5 |
| Infrastructure | Operators on a Section Line | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | Section Code | 3 |
| | | Railway Service Operator Initials | 4 |
| | | Railway Service Operator Code | 5 |
| | | Comments | 6 |
| Infrastructure | Borders | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | Node Code | 3 |
| | | Abbreviation of the Connected Country | 4 |
| | | Combined Transport Border Crossing Possibilities | 5 |
| | | RO-LA Transit Trains | 6 |
| | | RO-LA Export or Import Trains | 7 |
| | | Combined Transit Transport | 8 |
| | | Combined Export or Import Transport | 9 |
| | | Block or Shuttle Trains Transit | 10 |
| | | Block or Shuttle Export or Import Trains | 11 |
| | | Mixed Freight Transit Trains Inspected | 12 |
| | | Mixed Freight Transit Trains without Inspection | 13 |
| | | Mixed Freight Trains Export or Import Inspected | 14 |
| | | Mixed Freight Trains Export or Import without Inspect. | 15 |
| | | Time for Pass.Long Dist.Trains no Inspect. Needed | 16 |
| | | Processing Time for Pass. Regional or Local Trains | 17 |
| | | Type of Passenger Border Control | 18 |
| | | Customs Procedure for Freight on the Border | 19 |
| | | Phyto Inspection | 20 |
| | | Veterinary Inspection | 21 |
| | | Nuclear safety Inspection | 22 |
| | | Dangerous Goods Transported | 23 |

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List of database fields

| Entity Category | Table Name | Field Name | No |
|---------------------|-------------------------------|---|----|
| Transport Equipment | Locomotives or Railcar | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | Locos/Rcars Code | 3 |
| | | Type of Locos/Rcars | 4 |
| | | Railway Enterprise Code 2. | 5 |
| | | Total Num of the owned Locos/Rcars by Railway Ent. | 6 |
| | | Total Num of the Not owned Locos/Rcars by Rail. Enterprise | 7 |
| | | Type of Power Driven | 8 |
| | | Length over Buffers | 9 |
| | | Wheel set Gauge | 10 |
| | | Maximum Axle Load | 11 |
| | | Maximum Speed | 12 |
| Transport Equipment | Coaches | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | Coach Code | 3 |
| | | Type of Coach | 4 |
| | | Railway Enterprise Code 2 | 5 |
| | | Total number of the owned coaches by the Rail. Enterprise | 6 |
| | | Total num. of the Not owned coaches by the Rail. Enterprise | 7 |
| | | Average Length over Buffers | 8 |
| | | Wheel set Gauge | 9 |
| | | Maximum Axle Load | 10 |
| | | Maximum Speed | 11 |
| Transport Equipment | Wagons | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | Wagon Code | 3 |
| | | Type of Wagon | 4 |
| | | Railway Enterprise Code 2. | 5 |
| | | Total Num of the owned Wagons by the Railway Enterprises | 6 |
| | | Total Num of the Not owned Wagons by the Rail Enterprises | 7 |
| | | Average Length over Buffers | 8 |
| | | Wheel set Gauge | 9 |
| | | Maximum axle load | 10 |
| | | Maximum speed | 11 |

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List of database fields

| Entity Category | Table Name | Field Name | No |
|--------------------|--|--|----|
| Combined Transport | Combined Transport Quantity | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | Railway Enterprise Code 3. | 3 |
| | | Total number of TEU Export | 4 |
| | | Total weight of Combined Transport Export | 5 |
| | | Total number of TEU Import | 6 |
| | | Total weight of Combined Transport Import | 7 |
| | | Total number of TEU Transit | 8 |
| | | Total weight of Combined Transport Transit | 9 |
| | | Definition of route (relation-1) Start Node 1 | 10 |
| | | Definition of route (relation-2) End Node 1 | 11 |
| | | Definition of route (relation-3) Via Node 1 | 12 |
| | | Definition of route (relation-4) Via Node 2 | 13 |
| | | Definition of route (relation-5) Via Node 3 | 14 |
| Auxiliary | Country – ISO 3166 | Numeric Code | 1 |
| | | Country Code – according ISO 3166-2 three letters codification | 2 |
| | | Short name of the country | 3 |
| | | Official name of the country | 4 |
| Auxiliary | AGC, AGTC and TER Line Codes | International AGC, AGTC and TER Line Code | 1 |
| | | Comments | 2 |
| Auxiliary | Pan-European Corridors | Pan-Eruropean Corridor Code (Short Name) | 1 |
| | | Pan-European Corridor Name | 2 |
| | | Comments | 3 |
| Auxiliary | West-Est, North-South country sorting number per AGC, AGTC or TER line | Data valid for the year | 1 |
| | | Country Code | 2 |
| | | AGC, AGTC or TER Line Code | 3 |
| | | Sort Order Number | 4 |
| Auxiliary | Node Code - UIC & TER | Node code | 1 |
| | | Short node name | 2 |
| | | Full name of the node | 3 |
| Auxiliary | Line Load Limit | Line load limit code | 1 |
| | | Line load limit comment | 2 |

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List of database fields

| Entity Category | Table Name | Field Name | No |
|-----------------|-------------------------|---|----|
| Auxiliary | Rail Loading Gauge | Rail loading gauge code | 1 |
| | | Rail loading gauge comment | 2 |
| Auxiliary | Land Type | Land code | 1 |
| | | Land (type) name | 2 |
| | | Comment | 3 |
| Auxiliary | Track Type | Track code | 1 |
| | | Track short name | 2 |
| | | Track full name | 3 |
| | | Track gauge | 4 |
| Auxiliary | Sleeper type | Sleeper code | 1 |
| | | Sleeper name | 2 |
| | | Description | 3 |
| Auxiliary | Level Crossing Protect. | Level crossing protection code | 1 |
| | | Level crossing protection short name | 2 |
| | | Level crossing protection full name | 3 |
| Auxiliary | Traction System | Traction system code | 1 |
| | | Traction system name | 2 |
| | | Traction system type | 3 |
| | | Comment | 4 |
| Auxiliary | Locomotive Type | Locomotive or railcar code | 1 |
| | | Locomotive or railcar short name | 2 |
| | | Locomotive or railcar full name | 3 |
| | | Locomotive or railcar driven power | 4 |
| | | Locomotive or railcar usage - for pass, for freight, universal loco, etc. | 5 |
| Auxiliary | Coach Type | Coach code | 1 |
| | | Coach classes | 2 |
| | | Coach type | 3 |
| Auxiliary | Wagon Type | Wagon code | 1 |
| | | Wagon group | 2 |
| | | Comment | 3 |
| Auxiliary | Control (border) Type | Control code | 1 |
| | | Control short name | 2 |
| | | Control full name | 3 |
| Auxiliary | Inspection Type | Inspection Code | 1 |
| | | Inspection short name | 2 |
| | | Inspection full name | 3 |
| Auxiliary | Terminal Access | Terminal access code | 1 |
| | | Terminal access short name | 2 |
| | | Terminal access full name | 3 |