Central technical register of roads in Slovakia/Road Databank
## Slovak Republic

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital city</td>
<td>Bratislava</td>
</tr>
<tr>
<td>Inhabitants</td>
<td>476,922</td>
</tr>
<tr>
<td>Surface area [km²]</td>
<td>49,034.55</td>
</tr>
<tr>
<td>Population</td>
<td>5,428,792</td>
</tr>
<tr>
<td>of which females [%]</td>
<td>51.1</td>
</tr>
<tr>
<td>Population density [popul. per km²]</td>
<td>110.67</td>
</tr>
<tr>
<td>Number of Regions</td>
<td>8</td>
</tr>
<tr>
<td>Number of Districts</td>
<td>79</td>
</tr>
<tr>
<td>Number of Municipalities</td>
<td>2,890</td>
</tr>
<tr>
<td>of which with City statute</td>
<td>141</td>
</tr>
</tbody>
</table>
Road Network in Slovakia

- Classification of Roads by their traffic importance:
  - motorways (international, transit traffic)
  - roads:
    - 1st class/state (transport among regions of Slovakia)
    - 2nd class/regional (traffic within regions)
    - 3rd class/local (connections among higher class roads and urban roads)
  - urban roads – within administration boundaries of towns and villages
Slovak road network

Length of Roads by their classification [km]

<table>
<thead>
<tr>
<th>Roads classification</th>
<th>Length [km]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorways</td>
<td>864,649</td>
</tr>
<tr>
<td>State roads</td>
<td>3,334,747</td>
</tr>
<tr>
<td>Regional roads</td>
<td>3,615,214</td>
</tr>
<tr>
<td>Local roads</td>
<td>10,328,205</td>
</tr>
<tr>
<td>Urban roads</td>
<td>40,855,700</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>58,998,515</strong></td>
</tr>
</tbody>
</table>

- Motorways
- State roads
- Regional roads
- Local roads
- Urban roads
Central technical register of roads

- Central register of technical data which represents a road – its parts and equipment

act no. 135/1961 Zb. „Road act“/ duty for Ministry of transport of the Slovak republic

Slovak Road Administration realizes this agenda for the whole road network in Slovakia through team of specialists, technical equipment and support of information system of Road network model

IS – tool for data creating, data maintenance, data elaboration – data publishing

Data is the biggest benefit!
Main groups of data

Central technical register of roads

Reference network (line model)

Technical data

Inventory

Parts of roads

Road equipment

Pavement

Bearing capacity

Unevenness

Skid resistance

Road surface conditions

Road structures

Bridges

Culverts

Underpasses

Tunnels

Railway crossings

Road constructions

Finished constructions

Road constructions

Roads

Sections

Routes

Nodes
Central register of roads - workflow

Information system of Road network model

- information sources (MoT SK, road administrators, investors)
- new data to production GDB, data updating, data validation
- public GDB, data services, data outputs

ESRI / ArcGIS server, desktop RDBMS MS SQL

Digital modelling of road network - Road network model
New Road/part of Road is built – based on Approval of MoT about changes in Road Network

„little changes“ – information from road administrators

Centrelines of carriageways

GPS measurements with real time differential correction postprocessing (skpos corrections)

Coordination system: ETRS 89, accuracy: x,y – up to 1m, z – up to 2,5m
<table>
<thead>
<tr>
<th>Úsek pozemnej komunikácie: D1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trieda PK</strong></td>
</tr>
<tr>
<td><strong>Číslo PK</strong></td>
</tr>
<tr>
<td><strong>Pôvodné číslo PK</strong></td>
</tr>
<tr>
<td><strong>Legislatívny stav</strong></td>
</tr>
<tr>
<td><strong>Smer úseku</strong></td>
</tr>
<tr>
<td><strong>Dopravný smer</strong></td>
</tr>
<tr>
<td><strong>Evidenčná dĺžka</strong></td>
</tr>
<tr>
<td><strong>Počiatočný uzol</strong></td>
</tr>
<tr>
<td><strong>Koncový uzol</strong></td>
</tr>
<tr>
<td><strong>Názov úseku</strong></td>
</tr>
<tr>
<td><strong>Vlastník</strong></td>
</tr>
<tr>
<td><strong>Správca</strong></td>
</tr>
<tr>
<td><strong>Typ úseku</strong></td>
</tr>
<tr>
<td><strong>Stavebná kategória</strong></td>
</tr>
<tr>
<td><strong>Funkčná klasifikácia</strong></td>
</tr>
<tr>
<td><strong>Ulica</strong></td>
</tr>
<tr>
<td><strong>ID úseku</strong></td>
</tr>
<tr>
<td><strong>Okres</strong></td>
</tr>
<tr>
<td><strong>Kraj</strong></td>
</tr>
<tr>
<td><strong>Obec</strong></td>
</tr>
<tr>
<td><strong>Rozhodnutie</strong></td>
</tr>
<tr>
<td><strong>Prejazdová dĺžka</strong></td>
</tr>
<tr>
<td><strong>Peáž</strong></td>
</tr>
</tbody>
</table>

- **standard:**
- STN EN ISO 20524-1, STN EN ISO 20524-2
- Intelligent Transport Systems
- Geographic Data Files
Inventory

- Data collection/point and line events – perpendicular projection to section/linear referencing to section (data collection directly on roads, information from road administrators, from roads design documentation).
Inventory

- Data collection/point and line events – perpendicular projection to section/linear referencing to section (data collection directly on roads, information from road administrators, from roads design documentation)
New technology – Mobile mapping system

- LiDAR based technology (2 LiDAR sensors, RIEGL VMX-450-1HA, rotation 10 -250 turns/s, 1 mil.points/s, range: 150 m)
- 4 cameras, 1 ladybug/panoramic camera
- Odometer
- IMU, GNSS
- HW, SW
- accuracy: up to 10 cm
Pavement diagnostics

Profilograph:
laser based technology/16 lasers
beam width 2,5 m/measured width 2,7 m
unevenness/IRI, ruts
network level/motorways+state roads every year
regional roads every 2 years
Pavement diagnostics

KUAB FWD 50, 150:
falling weight deflektometer
range of load: 12 – 50 kN
deflection, bearing capacity
project level/requests via PMS
Pavement diagnostics

Skiddometer BV11 VI:
- longitudinal skidd resistance skid: 17 %
- water film thickness: 0,5/1 mm
- coefficient of longitudinal friction $\mu$
- project level/requests via PMS
Pavement diagnostics

Linescan:
continuous recording of the road surface
width of recording: 3,5 m
LED lightning system
pavement surface cracks - UCI
project level/requests via PMS
Information system of the Road Network Model

Cloud
IT infrastructure (primary DC+secondary DC)

Portal/WEB clients

Mobile clients

MS Windows Server
SQL Server – Production DB
ArcGIS Server
SW Web Applications

Terminal clients

Slovak road administration
IT infrastructure (production+testing)

MS Windows Server
SQL Server – Production DB
ArcGIS Server
ArcGIS license manager
Data usage

- free of charge
- state level – support for decision processes of transport economy
- other central state administration bodies (MoI, MoD, MoE,...) – support for their agenda
- agenda operated by SRA – PMS, BMS, routes for abnormal transports
- regional level - support for decision processes of regional transport economy
- research purposes, agenda of private companies
- international level (Inspire)

https://ismcs.cdb.sk/
Data publishing

- www.cdb.sk – statistical outputs, data sets, map documents, vector data, data services / wms, wfs
- data.slovensko.sk - state open data platform: datasets
- rpi.gov.sk – register of spatial information in Slovakia (catalog of metadata)
Thank you for your attention

Contact:
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