E-Road and E-Rail Censuses: Update, Future Plans and Traffic Visualisation

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Working Party on Transport Statistics, 5-17 June 2022
Overview

• E-Road 2020 Status and delays
• E-Rail 2020 Status
• Utility of censuses and future plans
• What about Inland Waterways?
2020 E-Road Census: Background

- E-Road Census collects infrastructure information + traffic volumes (AADT) on the E-Road network (as defined in the UNECE AGR agreement) every 5 years.
- Traffic breakdown (heavy vehicles versus light vehicles) useful as proxy for goods/people
- Data used for infrastructure planning, identification of bottlenecks, road safety benchmarking, regional modal split.
2020 E-Road Census: Received

- Received contributions from 12 countries. Armenia, Belarus, Bulgaria, Croatia, **Czechia, Finland**, Hungary, Kazakhstan, Netherlands, Russian Federation, Serbia, **Sweden** (bold gave Shapefiles)
- Delayed contributions: 6 countries (Austria, Germany, Poland, Romania, Slovakia, Switzerland)
Dissemination

https://unece.org/transport/transport-statistics/traffic-census-2020

<table>
<thead>
<tr>
<th>Country</th>
<th>Questionnaire</th>
<th>Map</th>
<th>Shapefiles</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armenia</td>
<td>XLS</td>
<td></td>
<td></td>
<td>Some vehicle-km data for 2015, 2019 and 2020.</td>
</tr>
<tr>
<td>Belarus</td>
<td>XLS</td>
<td></td>
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<td>No traffic volumes recorded in 2020.</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>XLS</td>
<td></td>
<td></td>
<td>Additional data on AADT at all counting posts.</td>
</tr>
<tr>
<td>Croatia</td>
<td>XLS</td>
<td>Croatia</td>
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<td>Traffic volumes for 172 posts, 2020 and 2015.</td>
</tr>
<tr>
<td>Czechia</td>
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<td>ZIP</td>
<td>DOC</td>
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<tr>
<td>Finland</td>
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<td>ZIP</td>
<td>Traffic volumes for 2019 and 2020.</td>
</tr>
<tr>
<td>Hungary</td>
<td>XLS</td>
<td>Hungary</td>
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<td>Total traffic volumes (split by type of traffic).</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>XLS (EN translation)</td>
<td></td>
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<td>Russian original</td>
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<tr>
<td>Netherlands</td>
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<td>Traffic volumes for 2169 posts for 2020</td>
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<td>Russian Federation</td>
<td>XLS</td>
<td></td>
<td></td>
<td>Traffic volumes for each E-Road for 2020 and 2015, (split by type of traffic).</td>
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<tr>
<td>Serbia</td>
<td>XLS</td>
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<tr>
<td>Sweden</td>
<td>XLS</td>
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</table>
## Dissemination (Croatia example)

<table>
<thead>
<tr>
<th>E-Road number</th>
<th>Counting post number</th>
<th>Length of road section</th>
<th>Number of carriageways</th>
<th>Normal width of road section of each carriageway</th>
<th>Number of lanes</th>
<th>Normal or average width of lanes between counting posts</th>
<th>Width of central reserves</th>
<th>Width of emergency stopping strips</th>
<th>Average design speeds</th>
<th>Annual average daily motor traffic flow in 2020</th>
<th>% change in comparison with 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>59</td>
<td>1114</td>
<td>7.5</td>
<td>2</td>
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<td>3.75</td>
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<td>2.5</td>
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</tbody>
</table>
Dissemination

2020 (or 2021) submissions

- Please provide by 10 September if possible, even if incomplete.
Mapping with Limited Information

• Even a single AADT figure for an entire E-Road in a country can have value.

• But coordinates of counting posts allow this to be done at a much greater degree of detail.
Road Census Future Plans

• Some of the excel tables have limited value/are very detailed.
• Main value added of the road census is geospatial analysis of traffic patterns.
• Would a simplified questionnaire asking mainly for traffic counts (with coordinates) be easier for NSOs and/or Highway agencies to complete?
No Shapefiles? No problem!
E-Rail Census

- Reminder: collects traffic information (trains per year, broken down by passenger and goods).
- Split the network into network segment identifiers.
- Some infrastructure information (type of current etc) asked for too.
- Eurostat countries: this is Annex V/Annex G
E-Rail Census

For non-Eurostat countries, please provide your results by 30 June 2022

UNECE maps these results automatically as straight lines

Future: use the AGR to project the straight lines into the real network?

https://unece.org/traffic-census-2015
Visualising Inland water traffic

• WP.6 decided in 2019 to explore an E-IWW census-like exercise, but trying to use **existing** data sources.

• As no international IWW **traffic** data are available, let’s try to use origin-destination transport measurement instead.

• Eurostat *iww_go_atygofl* table main source
Process

• Import Eurostat NUTS2 origin-destination data
• Import the NUTS2 Geospatial objects separately and calculate their centroids
• Merge the activity data and the centroid coordinates
• Draw lines between each origin and destination (thickness based on tonnage)
• Plot the results in Leaflet (a mapping package)
Less useful

Flows > 220 kt. Somewhat useful (but hard to quantify so many lines on the Rhine.)
Good, but...

Can we map this on the real network?
Process

• Import a Shapefile of the “real” network (available from UNECE Infrastructure agreement AGN, “Blue book” database)

• Translate each origin and destination onto the closest node of the network (making 2300+ different paths)

• Chop these paths up into their individual edges between nodes

• Sum up each edge based on total tonnage passing through it

• Combine all the edges up into a single object and Plot
A shapefile is not a network. A network has nodes and edges.

Remaining issues

- Make the map interactive
- Holes in Shapefiles
- Manually move coastal centroids to the sea?
- Dealing with Region X>Region X flows (solution: geospatial jittering?)
- No account of canal width/navigability
- No sea connections
- Any similar data for non-Eurostat countries?

To be published soon
Uses in UNECE

• Quantifying value of transport infrastructure (AGC, AGN, AGR)
• Highlighting where certain products (Energy? Food?) moved
• Modal split on specific corridors and identifying shift opportunities: where can goods be taken off the road?
• Apply the same method to Rail Census, other sources (road?)
Census Summary

• E-Road census:
  • Please provide any traffic data (2020/2021) by September if possible.
  • If no Shapefiles, can you provide coordinates of counting posts?
  • How should the census evolve for 2025?

• E-Rail census:
  • Non-Eurostat countries: data by end of June
  • The secretariat will try to improve results visualisation

• Further visualization ideas (IWW and other sources) to be explored