



# UNECE Road Transport Statistics within the SDGs

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*Podgorica, 11-12 October 2017*



# Overview

- SDGs monitoring mechanism
- What to measure?
- Glossary for Transport Statistics
- Infrastructure
- Vehicle fleet
- Road Traffic
  - Vehicle km
  - Goods tonnage and tonne-km
  - Passenger-km
  - E-Road Census
  - Bus and coach statistics
- How to collect the data?



# Development of SDG indicators

- UN General Assembly adopted the 17 goals 169 targets in September 2015
- United Nations Statistical Commission (UNSC) established Interagency and Expert Group on SDG Indicators (IAEG-SDG). Country led process to develop a list of indicators for SDG monitoring, and provide support for the implementation of the indicator framework to 2030, review capacity building, report on progress towards SDGs



## Development of SDG indicators (2)

- Indicator list approved by UNSC in March 2016, refined in 2017
- IAEG-SDG has met 5 times, discussing work stream on disaggregation, and drafting group on guidelines on data flows
- Global list of over 230 indicators - for global review and follow-up <https://unstats.un.org/unsd/statcom/48th-session/documents/2017-2-IAEG-SDGs-E.pdf> (Annex III)
- Tier system to assess availability of the indicators
  - Tier 1 – internationally agreed methods and data widely available
  - Tier 2 – agreed methods exist but data are not widely available
  - Tier 3 – no agreed methods, no data

# IAEG-SDG further steps on SDG indicators

- **Work plan for developing methodologies** for Tier III indicators available ([https://unstats.un.org/sdgs/files/meetings/iaeg-sdgs-meeting-05/TierIII Work Plans 03 03 2017.pdf](https://unstats.un.org/sdgs/files/meetings/iaeg-sdgs-meeting-05/TierIII%20Work%20Plans%2003%2003%202017.pdf))
- Considering **data flows** – a drafting group set up (current recommendation: NSOs to coordinate all SDG data)
- Role of **custodian agencies**
- Continuous adjustment of indicators will be necessary – annual refinements; two **comprehensive reviews in 2020 and 2025**
- Increased **capacity building** needed
- Information about the work available at IAEG-SDG website:
  - <http://unstats.un.org/sdgs/iaeg-sdgs/>
  - Next IAEG-SDG meeting in November 2017

# SDG targets and indicators related to transport

3.6 By 2020, halve the number of global deaths and injuries from road traffic accidents

- 3.6.1 Death rate due to road traffic injuries
  - Tier 1
  - custodian agency – WHO, other agencies involved: UNECE

9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all

- 9.1.1 Proportion of the rural population who live within 2 km of an all-season road
  - Tier 3
  - custodian agency – World Bank, other agencies involved: UNEP, UNECE
  - more info: suggested methodology exists but not tested
- 9.1.2 Passenger and freight volumes, by mode of transport
  - Tier 1
  - custodian agencies – ICAO, ITF-OECD, other agencies involved: UPU, UNEP, UNECE



# SDG targets and indicators related to transport (2)

11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

- 11.2.1 Proportion of the population that has convenient access to public transport, by sex, age and persons with disabilities
  - Tier 2
  - custodian agency – UN-Habitat, other agencies involved: UNEP, UNECE
  - more information: City Prosperity Initiative, UN-Habitat has developed the methodology to aggregate the information at national, regional and global levels

# Transport: what do we want to know?

- How do people get around? What is the road/rail split?
- How are goods transported around my country?
- How many cars/trucks are more than 10 years old?
- Can I measure road safety performance against number of cars, or km driven?
- How does our motorway network compare to our neighbours'?
- Can we visualize traffic volumes and highlight hotspots?





# Bad Transport Statistics!

**BuzzFeed**

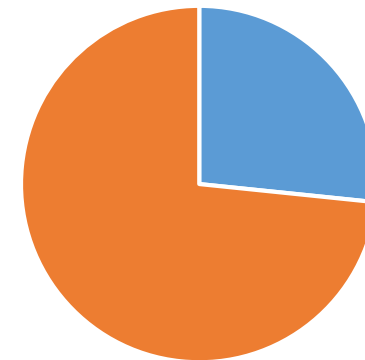
“ 9 Delightfully Geeky Stats About NYC Bridges And Tunnels ”

## 1. It's almost all cars.

Automobile traffic consistently makes up around 91% of the total vehicles going over and through the bridges and tunnels in a month. Trucks make up between 6 and 7 percent, and buses account for the final 2 to 3 percent.

Lincoln Tunnel

**Comparing passengers versus vehicles tells a very different story**



■ Total Persons by Auto, Van or Truck  
■ Total Persons by Bus

1. BuzzFeed article: [https://www.buzzfeed.com/johntemplon/9-delightfully-geeky-stats-nyc-bridges-tunnels?utm\\_term=.rc3RAVxyxy#.xrxjBRqz66z](https://www.buzzfeed.com/johntemplon/9-delightfully-geeky-stats-nyc-bridges-tunnels?utm_term=.rc3RAVxyxy#.xrxjBRqz66z)

2. Pie chart based on data from New York Metropolitan Transportation Council, via <http://nyc.streetsblog.org/2014/07/25/what-buzzfeed-missed-about-how-people-get-around-new-york/>



# Road Infrastructure

Simple total length of roads, broken down by type

- Motorways
- State roads
- Provincial roads
- Communal roads
- E-Roads
- Roads inside built-up areas
- Roads outside built-up areas

Useful base indicator for other analyses, and network assessment



# Road Infrastructure - Definitions

## Motorway/freeway

- Road, specially designed and built for motor traffic, which does not serve properties bordering on it, and which:
  - is provided with separate carriageways for traffic in two directions, separated from each other
  - Has no crossings at the same level with any road, railway or tramway track, or footpath
  - Is especially sign-posted as a motorway and is reserved for specific categories of road motor vehicles. Urban motorways are also included.



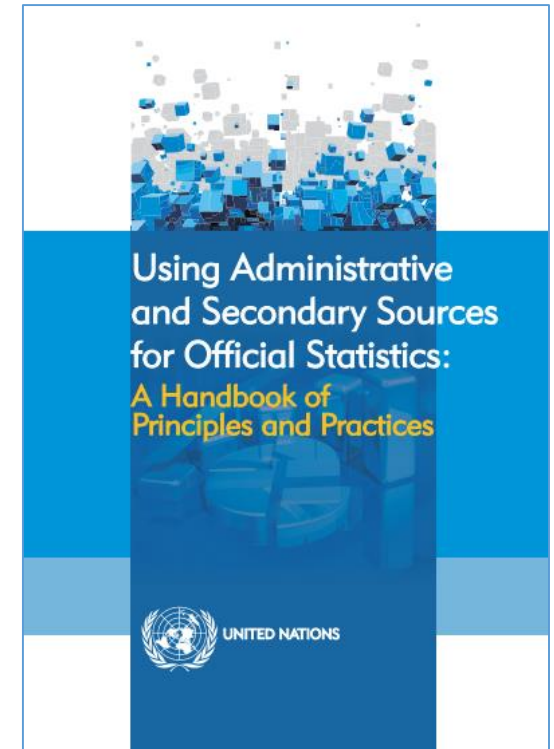
# Road Infrastructure - Collection

- Data from infrastructure managers, highway agencies, ministries of transport....
- These data don't come from surveys; network length is inelastic, thus administrative data should capture this.
- **Be pragmatic on estimation**



# A Note on Administrative Data

- “Data collected by sources external to statistical offices” (Conference of European Statisticians, 2000)
- Data might be collected for:
  - Personal tax/social security
  - Import/export duties
  - Business taxes



<http://www.unece.org/index.php?id=28898> (English and Russian)

# Transport Statistics Glossary

**B.V-10 Road passenger trip**

The combination between the place of embarkation and the place of disembarkation of passengers conveyed by a road vehicle.

*A passenger transfer from one vehicle directly to another one of the same kind, regardless of the undertaking, shall not be regarded as disembarkation / embarkation. Whenever during the transfer another mode of transport is used, this is to be regarded as disembarkation from a vehicle followed by a subsequent embarkation on another vehicle.*

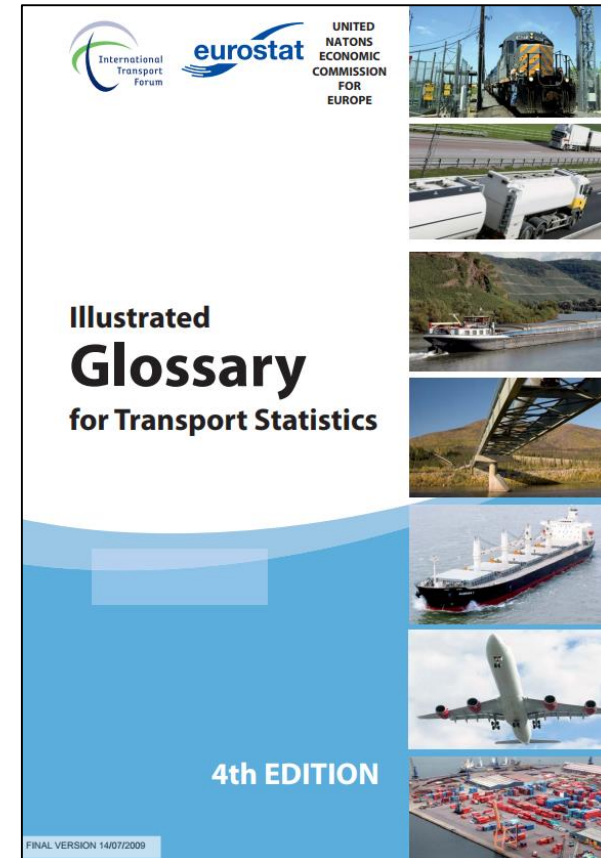
**B.V-11 Public road transport**

Public road transport covers passenger transport by bus or tram in scheduled service, whether operated by a public or private enterprise.

**B.V-12 Road passenger trip on public road transport**

The combination between the place of embarkation and the place of disembarkation of passengers conveyed by bus or tram.

*A passenger transfer from one vehicle directly to another one of the same kind, regardless of the undertaking, shall not be regarded as disembarkation / embarkation. Whenever during the transfer another mode of transport is used, this is to be regarded as disembarkation from a vehicle followed by a subsequent embarkation on another vehicle.*



# Vehicle Fleet

- Number of passenger and goods vehicles, broken down by type of vehicle:
  - Passenger cars
  - Motor coaches, buses and trolleybuses
  - Lorries
  - Road tractors
- Further breakdowns: age of vehicle, weight (for goods vehicles), fuel type.
- In parallel to this: number of **new** vehicle registrations, by type

Useful to understand number of vehicles per person, age of vehicle fleet, fuels used, road safety, emissions calculations





# Vehicle Fleet – Passenger Car

Road motor vehicle, other than a moped or a motor cycle, for the carriage of passengers and designed to seat no more than nine persons (incl. the driver). Included are:

- a) Passenger cars
- b) Vans designed and used primarily for transport of passengers
- c) Taxis
- d) Hire cars
- e) Ambulances
- f) Motor homes.

Excluded are light goods vehicles, motor-coaches and buses, and mini-buses/mini-coaches





# Vehicle Fleet – How to Collect?

- Administrative data sources
  - vehicle register
  - insurance information
  - car sales/scrappages
  - cars imported?
  - Can be supplemented or cross-checked by household or business survey/census data (“how many vehicles does your household have?”)



# Road traffic: three main areas

- Motor vehicle movements on national territory (vehicle km), by vehicle type
- Goods transport on national territory by road (tonnes carried and tonne-kms)
- Passenger transport on national territory by road (passenger km)



# Motor Vehicle-Km

- Motor vehicle movements on national territory (vehicle km), by vehicle type:
  - Motorcycles
  - Passenger cars
  - Coaches/buses
  - Lorries
- This is **all** motorized vehicles, goods and passengers

Gives local and national insights...AADT, total use of road network.



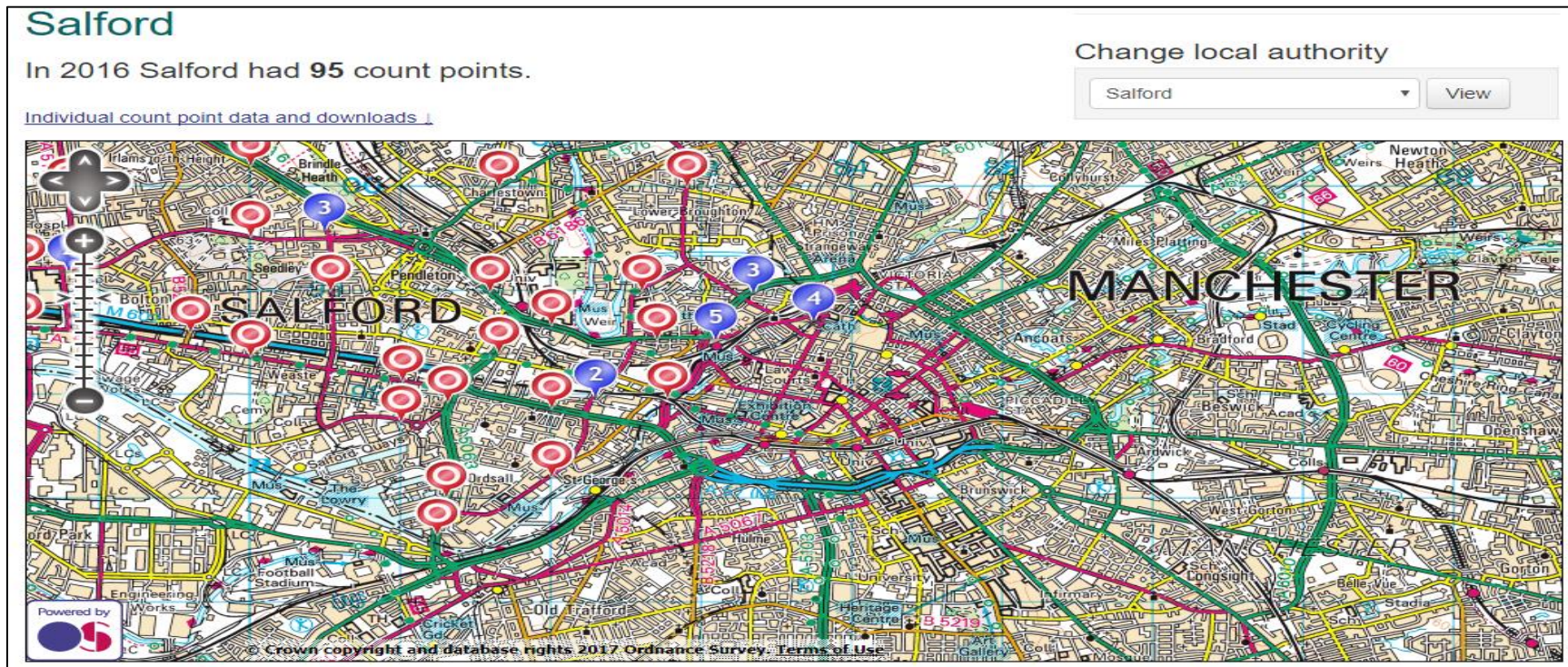
# Vehicle Movements: How to Collect?

- Traffic counts
  - Manual or automatic, constant or seasonal
- Odometer readings
- Additional: fuel consumption data, big data (phone GPS, satellite images)



# Vehicle Movements: What to Publish

- UK vehicle counter interactive map: <https://www.dft.gov.uk/traffic-counts/>
- Allows user to know AADT for every measured segment





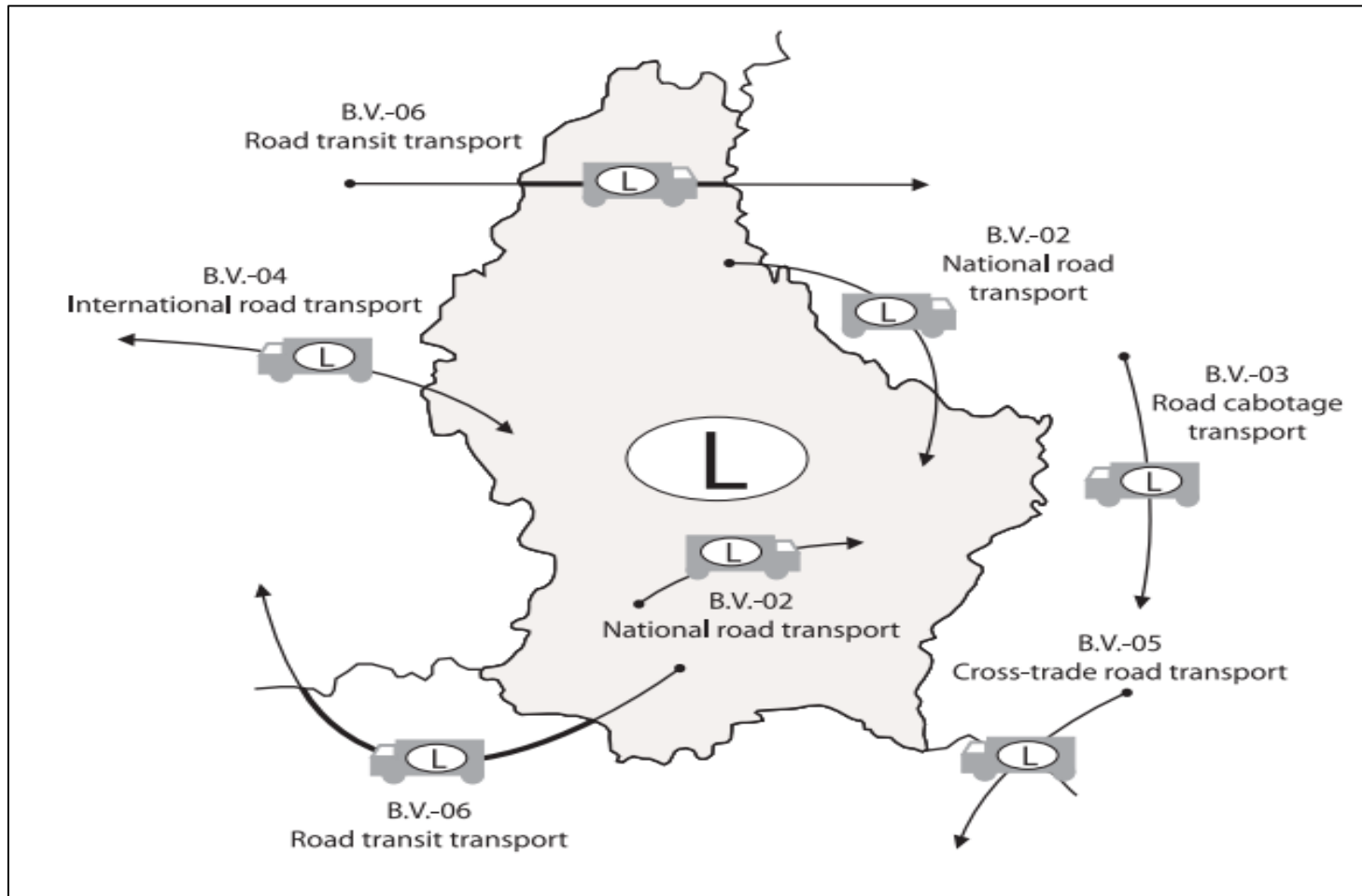
# Goods transport: tonnes, tonne-km

- Goods transport on national territory by road (tonnes carried, AND tonne-kms)
  - National transport within the country
  - International transport – (loaded+unloaded in the territory)
  - Cross-trade transport
  - Road cabotage
    - *Of which: operated for hire and reward*
    - *Of which: operated for own account*

Provides understanding of transport sector (and security of e.g. food and energy supply), can be compared with rail and waterway quantities to see how goods moved



# International transport can be complicated...



# Goods transport: how to collect?

- Surveys necessary, sent to HGV operators
  - Stratified sample, ask the weight of goods and distance travelled
  - A few hundred vehicles monitored each week
- For international transport, use surveys in combination with customs data
- Additional data: Customs, industrial production, cargo unloaded from trains or ships?





# Road traffic: Passenger Km

- Passenger transport on national territory by road (passenger km)
  - By motorcycles
  - Passenger cars
  - Motor coaches
- Private drivers included, taxi drivers excluded



Data important, used for modal split calculations, commuting trends, analysis of travel patterns, access to jobs and education, carbon intensity of total travel

# Road traffic passenger-km: How to Collect?

- Countings (manual and automatic, constant and seasonal)
- Odometer readings (during road worthiness tests)
- Household surveys
- Modelling (employment figures, energy consumption)
- New sources (big data, satellite information)

*Guesstimation: vehicle km \* 1.6?*



# Bus and Coach Statistics

- UNECE/Eurostat pilot questionnaire
- Covers
  - Coach movements (vehicle-km)
  - Journeys offered (number of journeys)
  - Seat km offered (seat-km offered)
  - Passenger transport (number of passengers)
- This is for **long-distance bus journeys**, i.e. Intercity routes, not local bus trips. (How to define “long-distance”?)



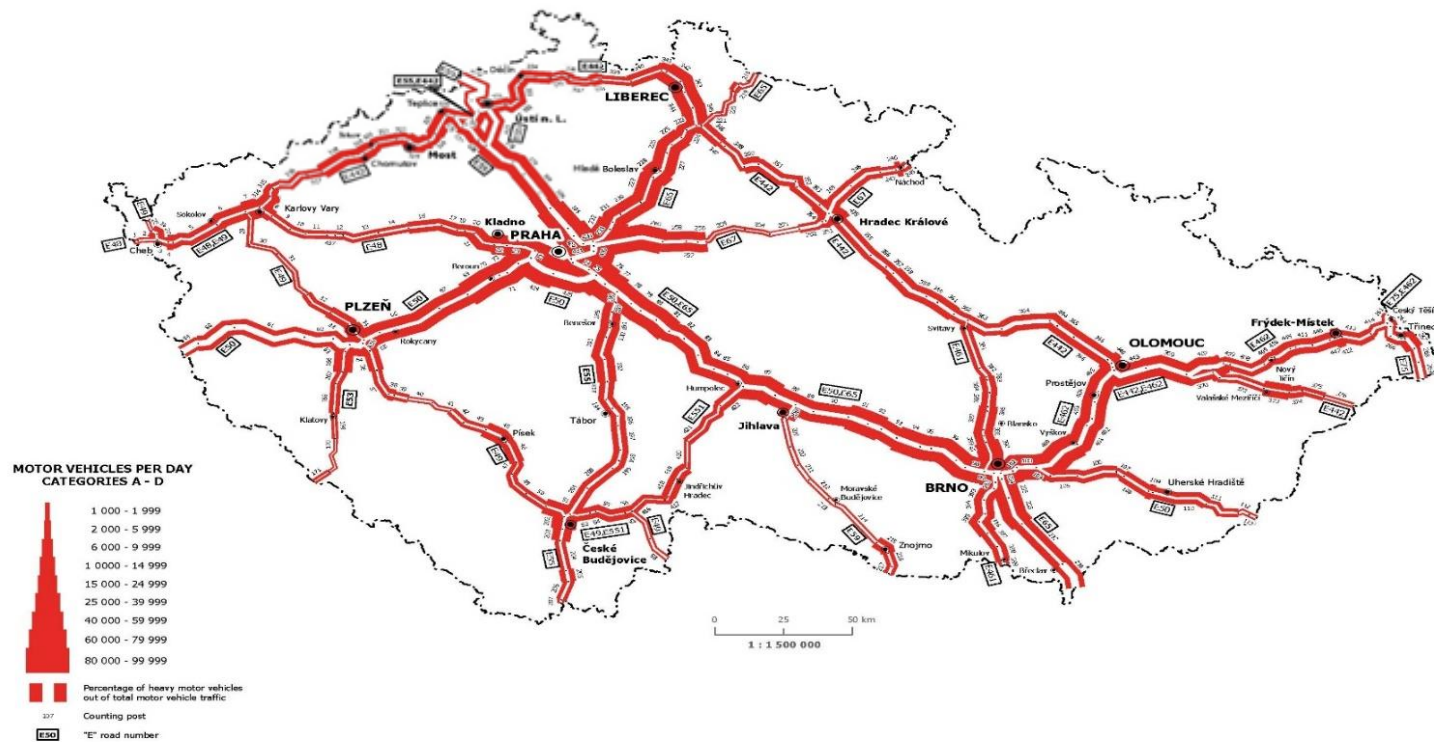
# E-Road Census

- Conducted every 5 years on E-Road network, defined European Agreement on Main Traffic Arteries (AGR)
- Collects basic E-Road infrastructure data, and detailed traffic numbers



# Road Traffic: E-Road Census

## CENSUS OF MOTOR TRAFFIC ON THE CZECH REPUBLIC E-ROADS IN 2016



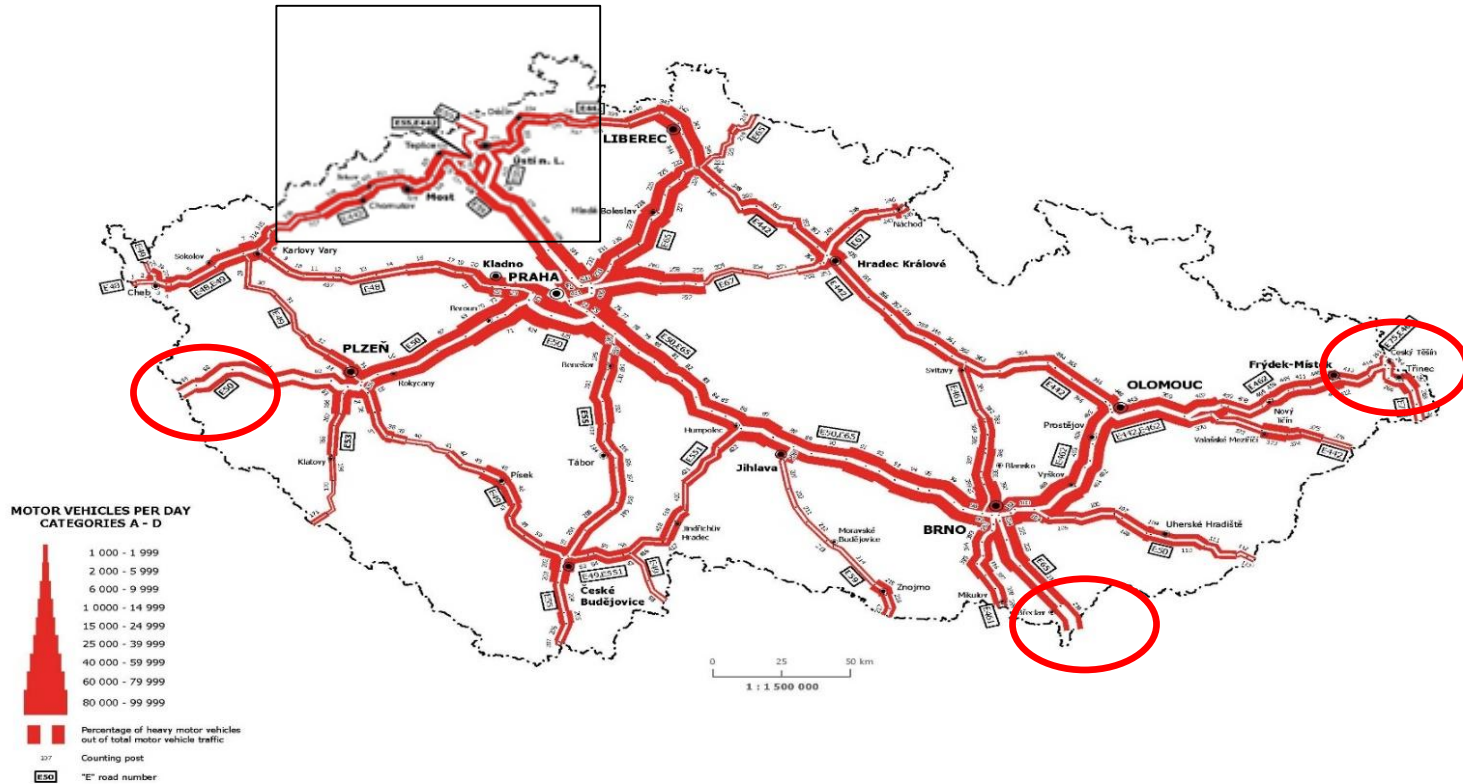


# Road Traffic: E-Road Census

White thickness indicates  
 HGV %. Shows the crucial  
 goods border crossings



**CENSUS OF MOTOR TRAFFIC ON THE CZECH REPUBLIC E-ROADS IN 2016**



# Road Traffic: E-Road Census



<https://www.unece.org/trans/areas-of-work/transport-statistics/statistics-and-data-online/e-roads/traffic-census-map.html>

# E-Road Census: What's needed

- Only covers the E-Road network – typically the top-level network (as defined in the AGR)
- AADT figures for each segment (defined by location of counting posts)
- Each post's geolocation. With basic free mapping software (e.g. ArcGIS) this is easily converted to a Shape file
- Using the same posts for future censuses improves long-term comparability





# Road Statistics feed into the SDGs

- 9.1.1: Mapping of road network can be combined with population density
- **9.1.2: passenger and freight volumes: passenger km and tonne-km**
- 11.2.1: number of bus passengers and seat-km offered relevant for public transport access



# UNECE Data

- Motor vehicle numbers sparse
- Data for passenger km much better (more countries collect data through surveys than counters?)
- Goods vehicle data (tonnes and tonne-km) reasonably complete

Passenger Transport on National Territory by Passenger-kilometres (millions), Country and Year

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total Passengers-km																
Albania	..	..	..	..	..	135	145	134	..	..	..	..	..	..	..	..
Andorra	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Armenia	785	1,125	..	..	..	..	..	..	..	2,356	..	..	..	..	..	..
Austria	77,073	77,497	78,503	79,693	80,504	81,230	81,461	83,211	..	..	..	11,323	86,132	..	..	..
Azerbaijan	9,153	9,442	9,603	..	..	..	..	..	..	15,291	16,633	..	20,034	21,880	22,992	23,825
Belarus	..	..	..	..	..	..	..	..	..	9,135	..	..	12,074	12,628	11,808	..
Belgium	..	..	..	..	..	127,610	129,130	133,600	132,590	131,470	131,170	..	135,070	132,615	..	..
Bosnia and Herzegovina	..	..	..	..	..	..	..	..	..	1,959	1,864	1,926	1,925	1,764	1,665	1,690
Bulgaria	14,749	15,370	16,706	..	..	..	..	..	..	9,773	9,633	9,481	10,482	8,667	9,920	..
Canada	..	483,440	493,814	512,992	500,924	525,694	..	..	..	494,700	..	..	..	..	..	..
Croatia	3,331	3,478	3,557	..	..	..	..	..	4,093	3,438	29,933	29,580	30,586	30,859	30,962	31,171
Cyprus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Czechia	80,190	81,061	81,820	82,675	81,684	84,248	85,645	87,661	88,487	87,287	79,944	80,304	78,719	79,382	..	..
Denmark	68,968	68,360	69,640	66,613	68,499	66,721	70,800	69,289	69,368	68,907	..	71,346	71,322	..	..	..
Estonia	..	..	..	..	..	..	..	..	..	..	2,241	..	2,234	..	..	..

UNECE Statistical Database >> Transport >> Road Traffic >> Motor vehicle movements on national territory by road (vehicle-kms)

1 Choose table    2 Choose variable    3 Show table

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Table settings

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Motor Vehicle Movements on National Territory by Vehicle-kilometres (millions), Country and Year

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total Veh-km																
Albania	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Andorra	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Armenia	200	232	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Austria	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Azerbaijan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Belarus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Belgium	..	..	..	..	..	87,770	..	..	91,330	..	..	..	..	..	..	..
Bosnia and Herzegovina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bulgaria	639	667	776	896	911	689	..	..	1,484	11,302	1,434	1,411	1,522	1,400	..	..
Canada	..	310,173	315,815	312,618	311,900	315,298	326,145	332,275	..	332,881	..	..	..	..	..	..
Croatia	13,847	359	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cyprus	..	..	..	..	..	..	..	..	6,700	..	..	..	..	..	..	..
Czechia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

# Summary

- SDGs monitoring mechanism applies to the transport-related indicators
- Infrastructure and vehicle data come from admin data
- Measurement and surveys needed for traffic volumes
- Consider administrative data sources
- Glossary creates internationally-comparable data
- E-Road Census visualizes traffic volumes across countries
- Report this data through the common questionnaire!



**Suggestions? Comments?**  
**We are here to help!**

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# ANNEX 1: Road Map for Statistics for SDGs

- Conference of European Statisticians (CES) road map for statistics for SDGs
  - Steering Group: to guide the CES work on statistics for SDGs - what, who, when, with whom needs to be done
    - 1) establishing national mechanisms for collaboration
    - 2) assessing readiness to report on SDG indicators
    - 3) selecting national indicators
    - 4) providing data on global SDG indicators – data flows
    - 5) capacity building
    - 6) communication and dissemination
- First Edition endorsed at CES in June 2017
- [https://www.unece.org/fileadmin/DAM/stats/documents/ece/ces/2017/CES\\_Road\\_Map\\_for\\_SDGs\\_First\\_Edition\\_final.pdf](https://www.unece.org/fileadmin/DAM/stats/documents/ece/ces/2017/CES_Road_Map_for_SDGs_First_Edition_final.pdf)

# Annex 2: Data Collection Examples

- UK Vehicle count methodology  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/611304/annual-road-traffic-estimates-2016.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/611304/annual-road-traffic-estimates-2016.pdf)
- UK National travel survey  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/633077/national-travel-survey-2016.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/633077/national-travel-survey-2016.pdf)
- Denmark travel survey  
<http://www.modelcenter.transport.dtu.dk/english/TU>
- Finland traffic volumes mapped  
<http://www.liikennevirasto.fi/web/en/maps-charts/traffic-volumes#.WddBz6iCyUk>
- USA National household travel survey <http://nhts.ornl.gov/>
- Travel Survey of Residents of Canada  
<http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=3810>

## Annex 3: UNECE Related Work

- Inland Transport Committee
- Border Crossing and Trade (TIR convention)
- Euro-Asian Links
- Transport and Classification of Dangerous Goods
- Road Transport (SC.1)
- Vehicle Regulations
- Road Safety

