EU project Baseline
measuring road safety performance indicators

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Introduction

- The EC has put forward a new approach to EU road safety policy for the decade 2021-2030, highlighting the need of establishing a range of road safety KPIs at European level, cf. https://ec.europa.eu/transport/sites/default/files/legislation/swd20190283-roadsafety-vision-zero.pdf: EU Road Safety Policy Framework 2021-2030 - Next steps towards "Vision Zero"

- KPIs are directly related to the prevention of road accident fatalities and serious injuries

- Call for proposals for KPI measurements => Baseline project (consortium of 18 countries)

- Baseline project aims to
  - assist authorities of EU Member States in the collection and harmonized reporting of KPIs for road safety and
  - contribute to building the capacity of those MS that have not yet collected the relevant data

EU Key Performance Indicators

KPI area	KPI definition (European Commission 2019)
Speed	Percentage of vehicles travelling within the speed limit
Safety belt	Percentage of vehicle occupants using the safety belt or child restraint system correctly
Protective equipment	Percentage of riders of PTWs and bicycles wearing a protective helmet
Alcohol	Percentage of drivers driving within the legal limit for blood alcohol content (BAC)
Distraction	Percentage of drivers not using a handheld mobile device
Vehicle Safety	Percentage of passenger cars with a Euro NCAP safety rating equal or above a threshold
Infrastructure	Percentage of distance driven over roads with a rating above an agreed threshold
Post-crash care	Time elapsed between the emergency call following a collision resulting in personal injury and the arrival at the scene of the collision of the emergency services

Particpating countries and organisations

Member State	Applicant organisation	Implementing Body
Belgium	Vias institute	
Austria	Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology	Kuratorium für Verkehrssicherheit (KfV)
Bulgaria	Bulgarian State Agency for Road Safety	
Cyprus	Ministry of Transport Communications and Works	
Czech Republic	Ministry of Transport	Transport Research Center (CDV)
Finland	Finnish Transport and Communications Agency Traficom	VTT Technical Research Centre of Finland
Germany	Federal Highway Research Institute (BASt)	
Greece	Directorate of Road Traffic & Safety in the Ministry of Infrastructure & Transport	National Technical University of Athens (NTUA)
Ireland	Road Safety Authority (RSA)	
Latvia	Ministry of Transport	
Lithuania	Public Enterprise Transport Competence Agency (TKA)	
Luxembourg	Ministry of Mobility and public works	
Malta	Transport Malta	
Netherlands	Ministry of Infrastructure and Water Management	Stichting Wetenschappelijk Onderzoek Verkeersveiligheid (SWOV)
Poland	Motor Transport Institute (MTI)	
Portugal	Portuguese Road Safety Authority (ANSR)	National Laboratory for Civil Engineering (LNEC), PRP, IMT, IP, INEM
Slovakia	Ministry of Transport and Construction	
Spain	Directorate-General for Traffic (DGT)	
Sweden	Sweden Transport Administration (Trafikverket)	

Data collection

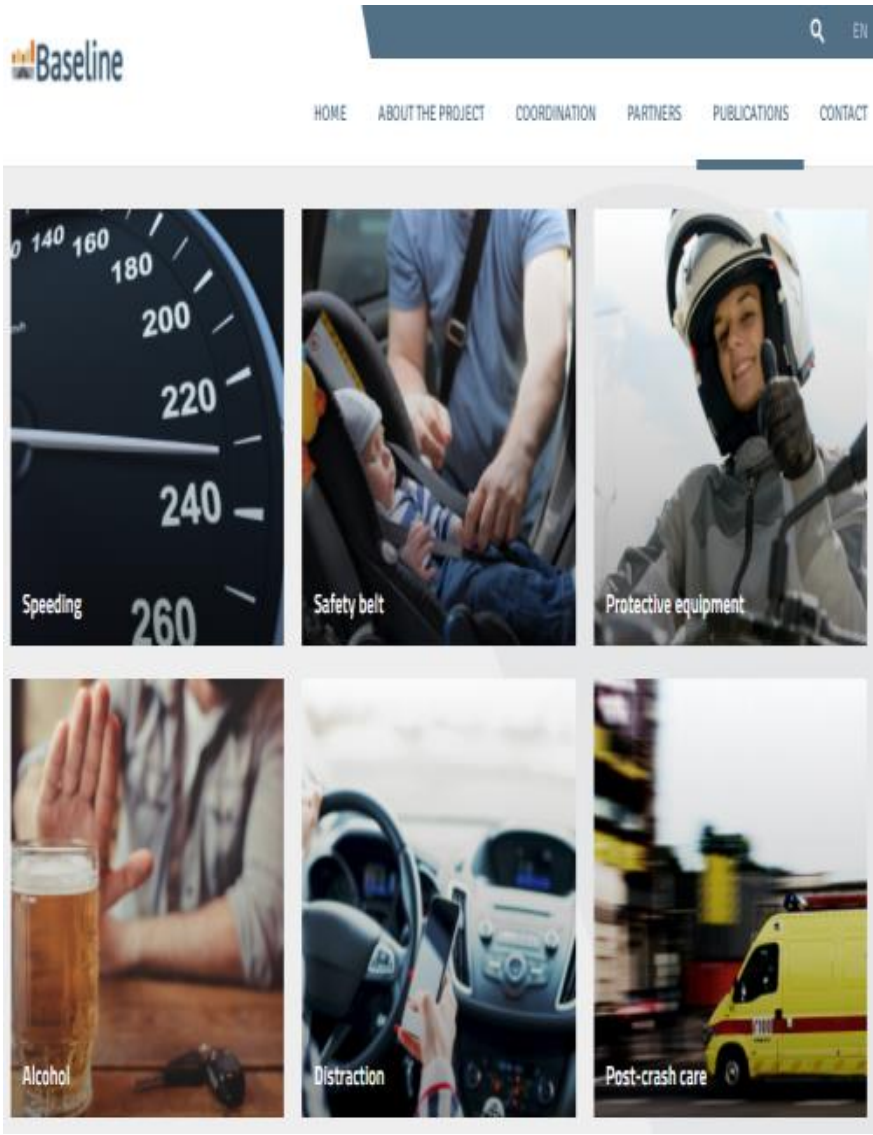
- Measurements for most KPIs took place in 2021 and 2022
  - some 2020 data included as well
  - for some KPIs data collection is still ongoing

- Final report: December 2022

	Speed	Safety belt	Pro-tective	Alcohol	Dis-traction	Vehicle	Infra-structure	Post-crash
Austria	X	X	X	X	X	X		X
Belgium	X	X	X	X	X	X		X
Bulgaria	X	X	X	X	X	X		
Cyprus	X	X	X	X	X	X	X	X
Czech Rep.	X	X	X	X	X	X		X
Finland	X			X	X	X	X	X
Germany		X	X	X	X			X
Greece	X	X	X	X	X	X		X
Ireland	X	X	X	X	X			
Latvia	X	X	X	X	X	X	X	X
Lithuania	X	X			X	X	X	X
Luxembourg	X	X	X	X	X			
Malta	X	X	X	X	X			
Netherlands	X	X		X	X	X		
Poland	X	X	X	X	X			
Portugal	X	X	X	X	X	X	X	X
Slovakia	X	X	X	X	X	X		
Spain	X	X	X	X	X	X		
Sweden	X	X			X	X	X	X
Number of countries	**18**	**18**	**15**	**17**	**19**	**14**	**6**	**11**

Methodological framework

- Common methodological framework for collecting data for the estimation of comparable KPIs at EU level:
  - Survey among the MS on existing data collection and needs for methodological support
  - International guidelines and methodologies available in the literature analyzed
  - Development of the methodological guidelines: KPI Expert Groups (KEG) and Technical Committee
  - For each KPI methodological guidelines are published: translating SWD 283 specifications into operational definitions + defining minimum requirements needed to assure comparability and reliability (taking feasibility into account)



Available at: https://baseline.vias.be/en/

Example: Speeding

- Data collection means: inductive loop detectors, radar sensors, video-based software tools, manual observation by measuring devices

- Minimum requirements:
  - free flowing traffic
  - driving under normal conditions (e.g. no adverse weather)
  - random selection of observation locations; a representative sample for the national road network
  - measurements on late spring and early autumn

- Temporal variations (weekdays/ weekends) and comparisons between day and night are recommended

- The national KPIs will be estimated separately by:
  - Vehicle type (personal cars)
  - Road type (motorways, rural roads, urban roads)
  - Time period (daytime on weekdays)

Methodological guidelines: key elements

- **Measurement tools**
  - General principles and technical specifications
  - Vehicle types
  - Parameters of interest
- **Sampling**
  - Overall sample sizes
  - Required strata & sample size per stratum
  - Selection and number of locations
- **Field work specifications**
- **Data delivery**
  - Datafile guidelines

Baseline

Methodological guidelines – KPI Speeding

Version 3.1, April 27, 2021

Requirements for representative speed measurements

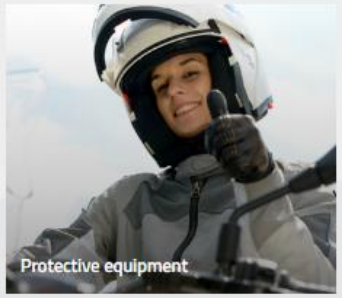
2.1 Free flowing traffic
2.2 Adequate observation equipment
- 2.2.1 *Choice of measurement method*
- 2.2.2 *Requirements for equipment*
- 2.2.3 *Minimum requirements*
- 2.2.4 *Unobtrusiveness of the equipment*
- 2.2.5 *Out-of-road devices*
- 2.2.6 *In-road devices*
- 2.2.7 *Hand-held devices*

2.3 Appropriate observation locations
- 2.3.1 *Choice of locations*
- 2.3.2 *Sampling of locations*
- 2.3.3 *Minimum sample size*

2.4 Stratifications and subpopulations
- 2.4.1 *Road types*
- 2.4.2 *Vehicle types*
- 2.4.3 *Time period (time of day, day of the week, month)*
- 2.4.4 *Region*
- 2.4.5 *Weather*

2.5 Data analysis
- 2.5.1 *Post stratification weights and statistical analysis*
- 2.5.2 *Expected results, data delivery and methodological report*

Methodological guidelines: minimum requirements



	Minimum requirement	Optional
KPI	• Percentage of drivers within speed limit • Free-flow traffic	• Average speed (+ Standard Deviation and Standard Error/Confidence Interval) • V85 • Non free flow traffic data
Location	• Random selection • Representative of entire national road network • Measurements should not take place near speed cameras, either fixed or mobile • A minimum traffic flow of at least 10 vehicles passing per hour is required	• Stratification by Regions
Road type	• Motorways • Rural roads (defined as roads outside built-up areas, but no motorways) • Urban roads (defined as roads inside built-up areas)	• Differentiate between single and dual lane roads for rural and urban roads • Differentiate between speed limits within rural and urban roads
Vehicle type	• Passenger cars	• Motorcycles • Vans and light trucks • Heavy trucks • Buses
Time period	• Weekdays • Daylight hours • Spring/autumn	• Weekend • Night-time hours
Weather	• Good conditions	
Sample size	• Min 2000 observations • Min 500 observations / road type • Min 10 locations / road type • The proportion of observations at each of the three road types should be at a minimum 20%	

Methodological guidelines: weighting, data delivery and data evaluation

- **Guidelines on statistical analysis: considerations for sampling weights and statistical analysis**
- **Common datafile formats**
  - including confidence intervals
  - including meta-data
  - aggregate and disaggregate levels
- **Data quality control**

Baseline

Considerations for sampling weights in Baseline

Version 1.3, December 6th, 2021

Baseline

Data Quality Control

Version 2.0, November 11, 2021

BASELINE - Speed

Minimum Level (required)

Time period	Road Type	Vehicle Type	Nr of Locations	N	Traffic Counts	Weight proportion	Average Speed	SE1	CI (95%) - lower bound1
weekday/daytime	motorways	passenger cars							
weekday/daytime	rural roads	passenger cars							
weekday/daytime	urban roads	passenger cars							
weekday/daytime	*(All roads)*	**passenger cars-Total**							

Minimum level (recommended options)

Time period	Road Type	Vehicle Type	Nr of Locations	N	Traffic Counts	Weight proportion	Average Speed	SE1	CI (95%) - lower bound1
weekday/daytime	motorways	passenger cars							
weekday/daytime	motorways	vans, small trucks							
weekday/daytime	motorways	trucks/ buses/ heavy goods vehicles							
weekday/daytime	motorways	motorcycles							
weekday/daytime	**motorways-Total**	*(All vehicles)*							
weekday/daytime	rural roads	passenger cars							
weekday/daytime	rural roads	vans, small trucks							
weekday/daytime	rural roads	trucks/ buses/ heavy goods vehicles							
weekday/daytime	rural roads	motorcycles							
weekday/daytime	**rural roads-Total**	*(All vehicles)*							
weekday/daytime	urban roads	passenger cars							
weekday/daytime	urban roads	vans, small trucks							

Status and next steps

- **8 Draft KPI reports ready for review: 15 September 2022**
- **Review process: 16 September => 18 October 2022**
- **First international KPI results presentation: General Assembly meeting October 19th**
- **Addition of lacking country data & final publications: 31 December 2022**
  - Methodological report on 8 KPIs
  - Policy report (including recommendations)
  - Administrative reporting

- **In parallel:**
  - Publication of call ***MOVE/C2/2022-54— Technical Assistance for the development and collection of Road safety Key Performance Indicators (KPI)***
  - International consortium under construction: Trendline proposal
  - Deadline for submission: October 13th 2022

Resources and info

Baseline

Methodological guidelines – KPI Speeding

Version 3.1, April 27, 2021

Baseline

Belgium | Austria | Bulgaria | Cyprus | Czech Republic | Finland | Germany | Greece | Ireland | Latvia | Lithuania | Luxembourg | Malta | Netherlands | PolandPortugal | Slovakia | Spain | Sweden

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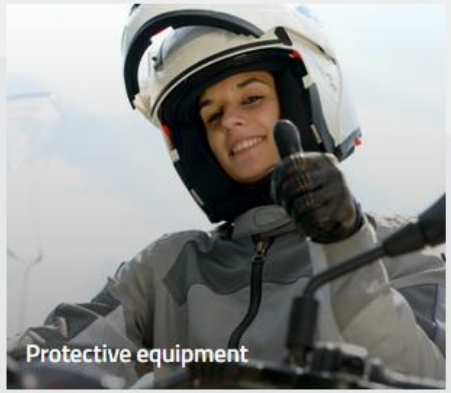
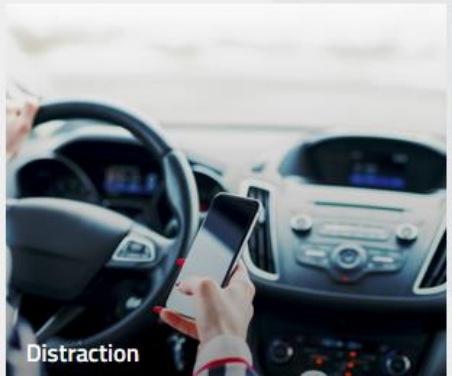
Methodological guidelines

The methodological guidelines for all KPIs are designed to ensure international comparability between KPI values while taking into account feasibility and affordability for the Member States. To that end the methodological guidelines have been defined in such a way that accurate and representative results can be obtained for all parameters of interest defined in the Commission staff working document "SWD 283". The guidelines include clear specifications of the minimum requirements, which already include some compromises with respect to the initial specifications of the Commission. The methodological guidelines also include guidelines for the minimum sample size and the number of observations.





Example 2: DUI alcohol

- Three types of data collection:
  - Random breath testing
  - Breath testing results from enforcement actions (even if not random)
  - Self-reported behaviour through anonymous surveys
- Random testing is preferred, however it is not allowed in some EU Member States
- During a roadside survey, drivers are sampled randomly; the selection is irrespective of possible suspicion for DUI
- Separate results are required for night hours and day time hours as well as for weekdays and weekend days
- Driver's age and gender as well as trip characteristics can optionally be observed
- The national KPIs will be estimated by:
  - Road type (motorways, rural roads, urban roads)
  - Time period (night/day x week/weekend)