

2nd Working Group 1 Meeting
Institutional Coordination and Data Systems
Knowledge Exchange Workshop
March 5th, 2018 – *tentative*
Tbilisi, Georgia

- Road accident database types and their functions
 - CADaS (Common Accident Data Set)

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World Bank

Integrated Road Accidents Database

- General data (population, area, statistics);
- Roads data;
- Traffic data;
- Road accidents data;
- Injuries data;
- Traffic fines data;
- Data about damage, costs and losses...



Importance of Integrated Road Accidents Database

- For Road Safety Analysis
- Define the current state
- Define the wanted state
- Evaluate the measures in road safety
- Evaluate the situation in Road Safety
- “BENCHMARKING”
- ...



Importance of Integrated Road Accidents Database

- Optimal data coverage
- Data quality
- Harmonization with other countries
- The availability
- The promptness
- ...



Road Safety and Road accident Database types

– INTERNATIONAL

- *IRTAD, CARE, UN, ...*

– NATIONAL

- *STRADA, VICROADS, UIS (Republic of Serbia), ...*

– LOCAL

- *London, Road Safety Portal in Serbia for cities and municipalities...*

– OTHERS

- Company road accidents database
- Researches database
- ...



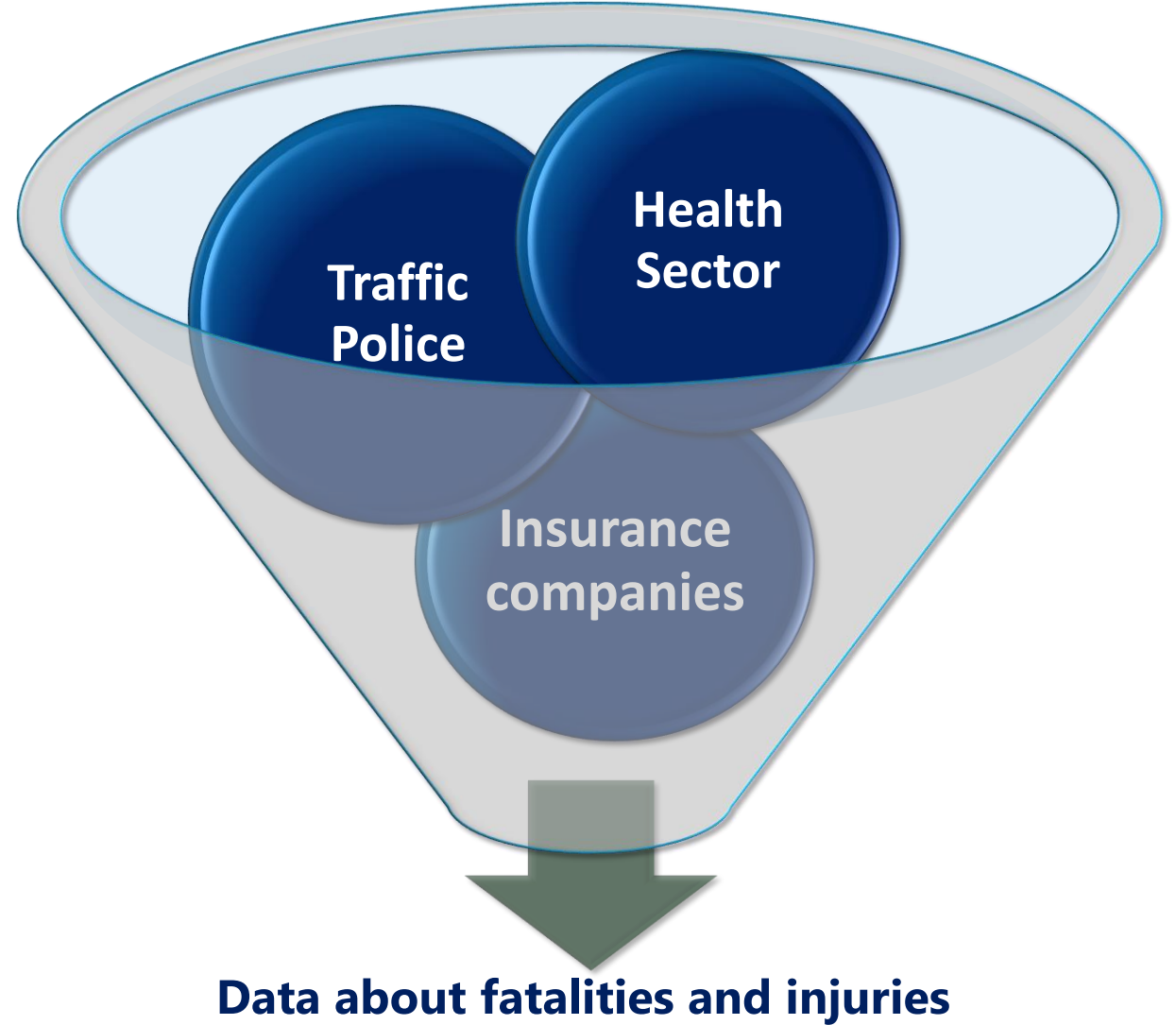
Road Accidents Database types

- THE RELATIONAL
 - UIS (Unique Information System), ...
- THE ANALITICAL
 - *STRADA, VICROADS, BERTAAD...*
- ROAD ACCIDENT DATABASE BASED ON GIS – with the support of *GPS* or *GLONASS.....GALLILEO*
- *BIG DATA DATABASE*
- CLASSICAL ROAD ACCIDENT DATABASE (*Excel, Access...*)



Road Safety Database

- Database – set of data organized according to the users needs; Established and used to getting information.



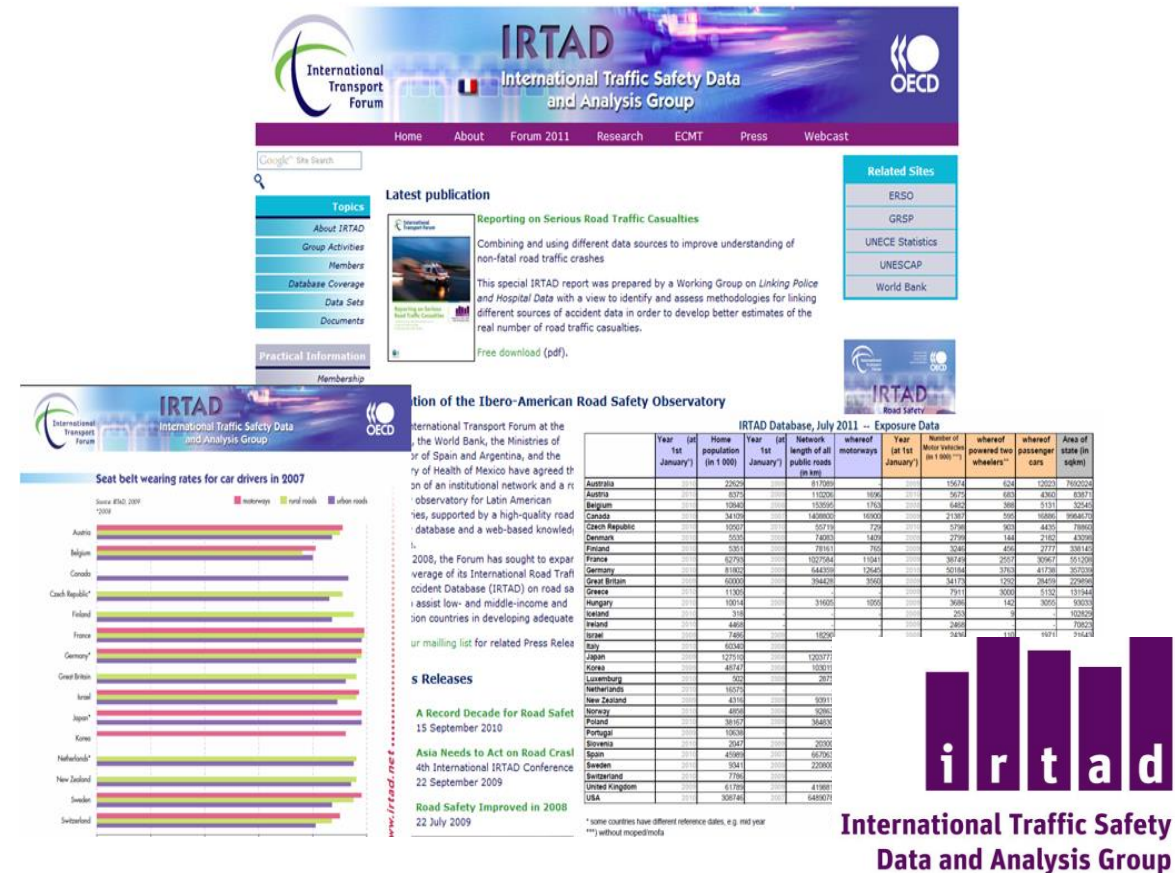
International Road Safety Database

- **IRTAD** Database (International Traffic Safety Data and Analysis Group)
 - General road safety data
 - Exist from 1988
 - Road Accident Data of the *OECD countries*
 - Summary database – does not have data about individual road accidents and victims



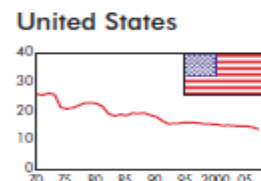
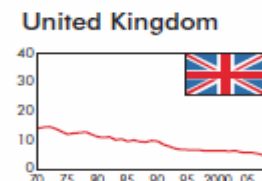
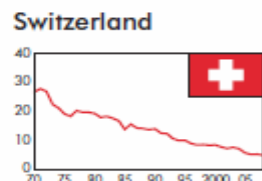
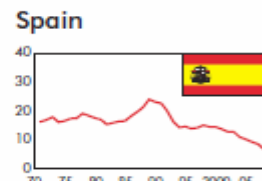
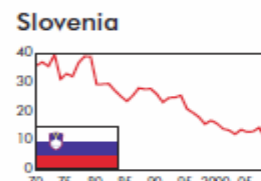
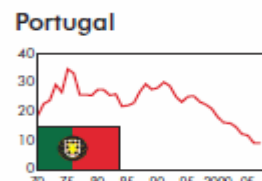
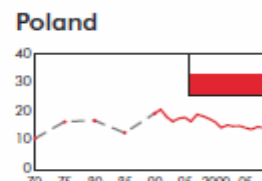
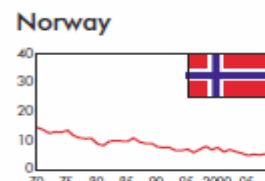
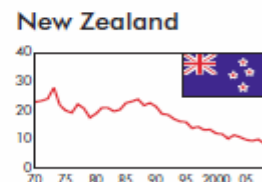
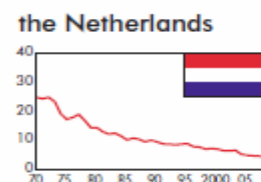
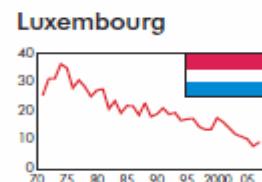
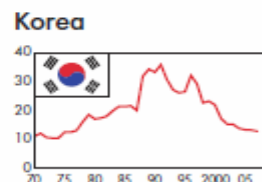
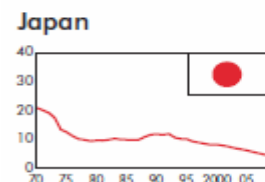
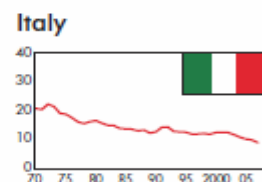
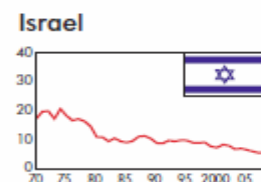
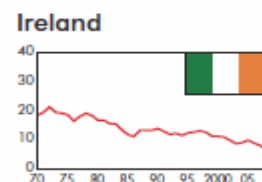
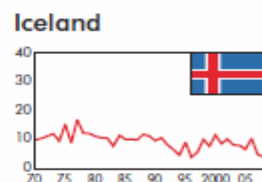
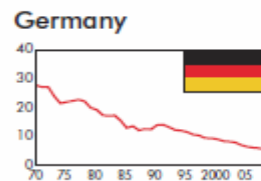
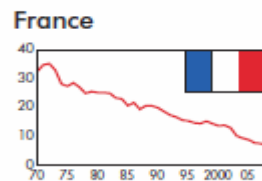
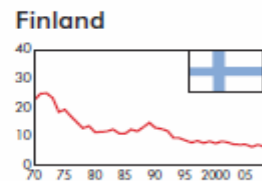
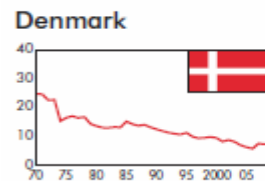
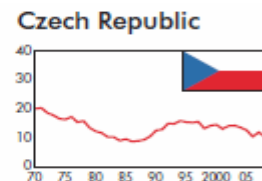
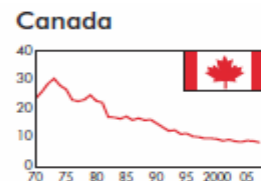
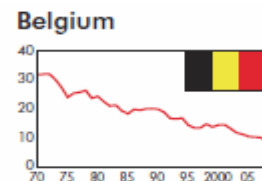
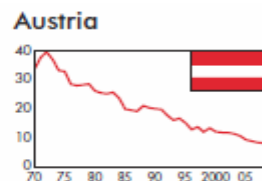
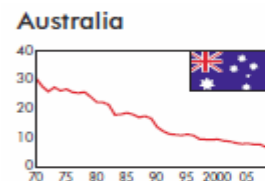
International Traffic Safety Data and Analysis Group (IRTAD) ITF

- The primary purpose:
 - Summarize road accident data on the international level
 - Increasing of quality and quantity relevant and available data
 - Facilitating access
 - Giving the answers about improving the road safety (i.e. researches)



International Traffic Safety Data and Analysis Group (IRTAD) ITF

- **Definition of key terms**
- **Set of data**
 - **General data**
 - Population
 - The age structure of the population
 - Number and structure of the vehicle
 - Roads length, ...
 - **Specific data**
 - Number of road accidents
 - Number of injuries
 - Fatalities
 - Hospitalized
 - Use of seat belt in %
 - Other SPI's ...



Source: IRTAD, 2009

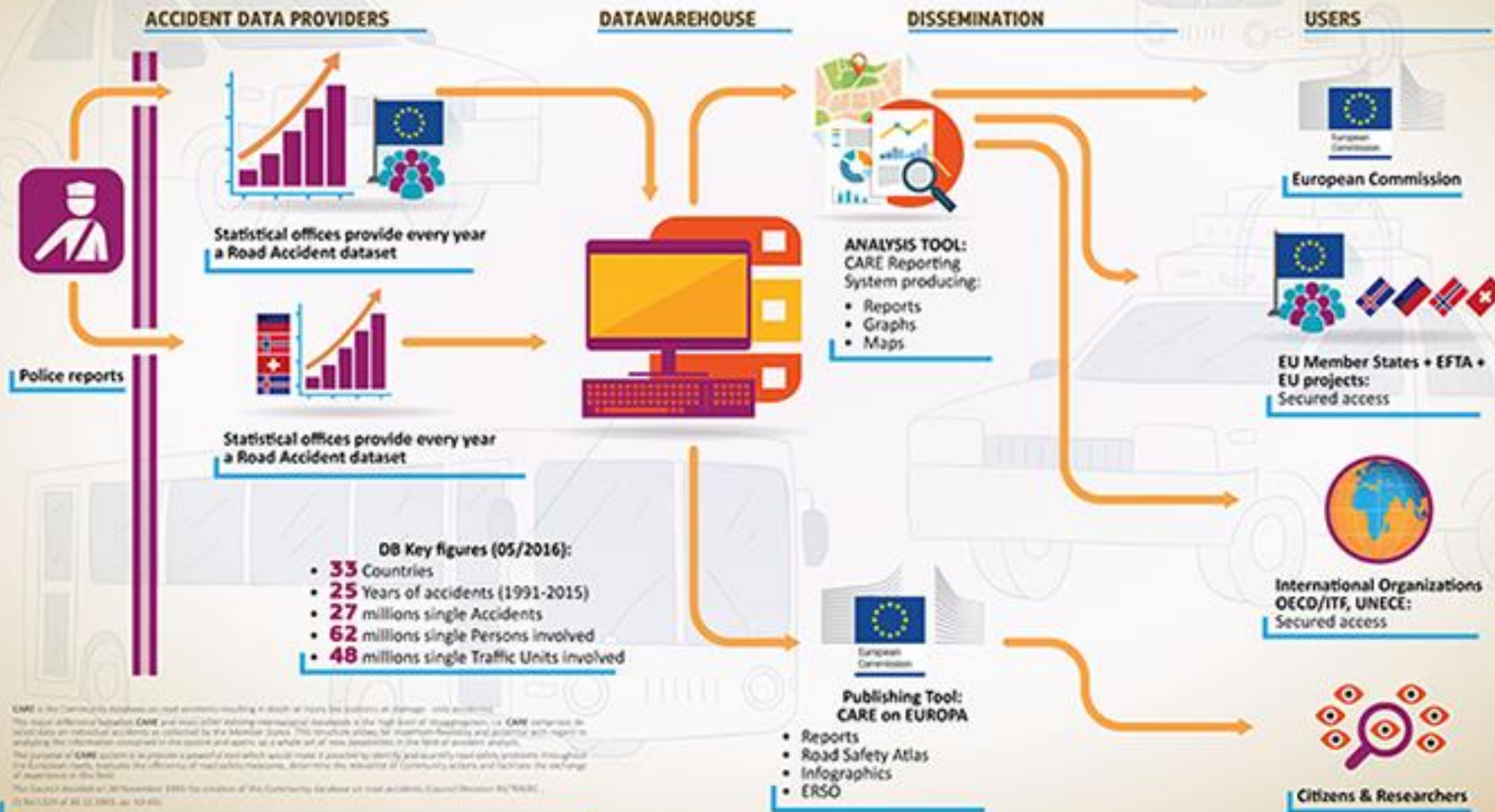


International Traffic Safety
Data and Analysis Group

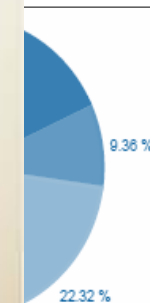


Community Road Accident Database - CARE

CARE: The European Union's road accidents database



European
centralised
database on
road accidents,
93/704/EC



pycja

Community Road Accident Database - CARE

- The primary purpose:
 - ✓ "Powerful weapon"
 - ✓ Identification and quantification of the road safety problem in European Union
 - ✓ Evaluation of the effectiveness of the road safety measures
 - ✓ Significance of the road safety actions
 - ✓ Easy exchange of experience

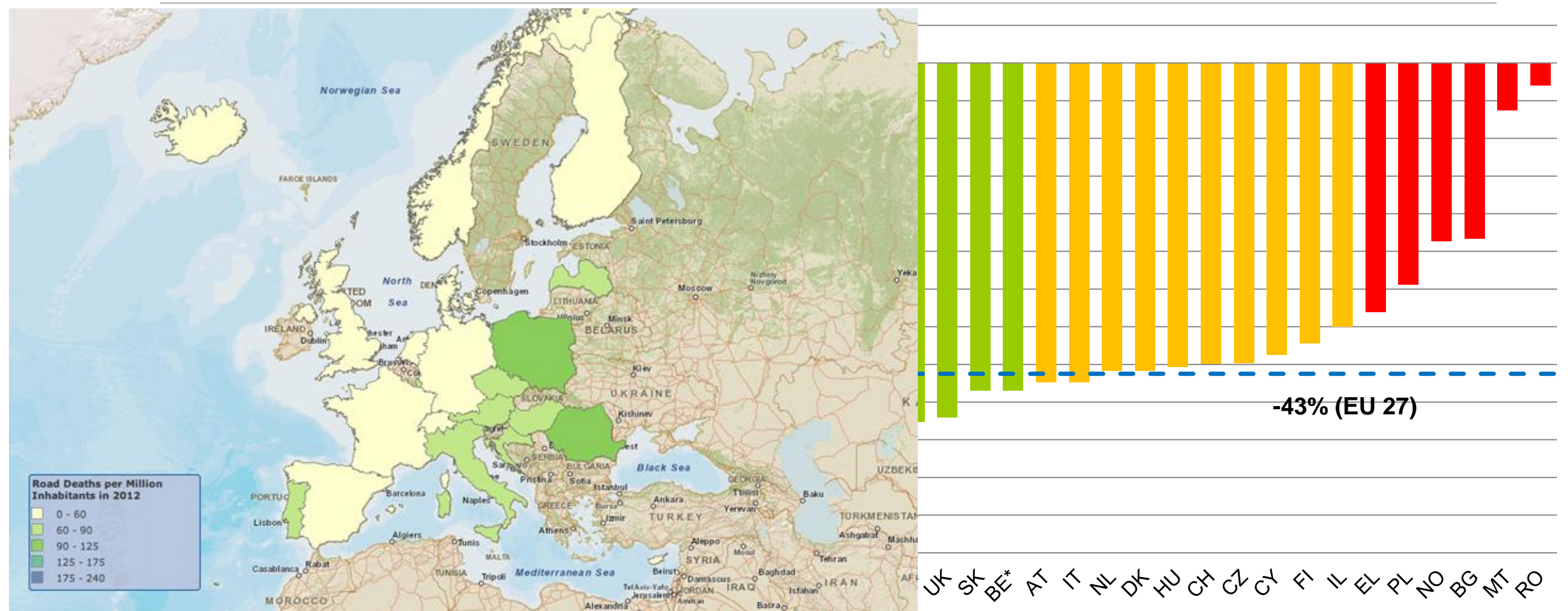


Community Road Accident Database - CARE

- Providing an objective assess of the problem size
- Identification of the action area
- All countries have obligation to give whole data except confidential data
- In addition of data every country gives and structure of data
- European Commission promote transformation rules in aim to standardizing data
- Tables, Graphs, ...



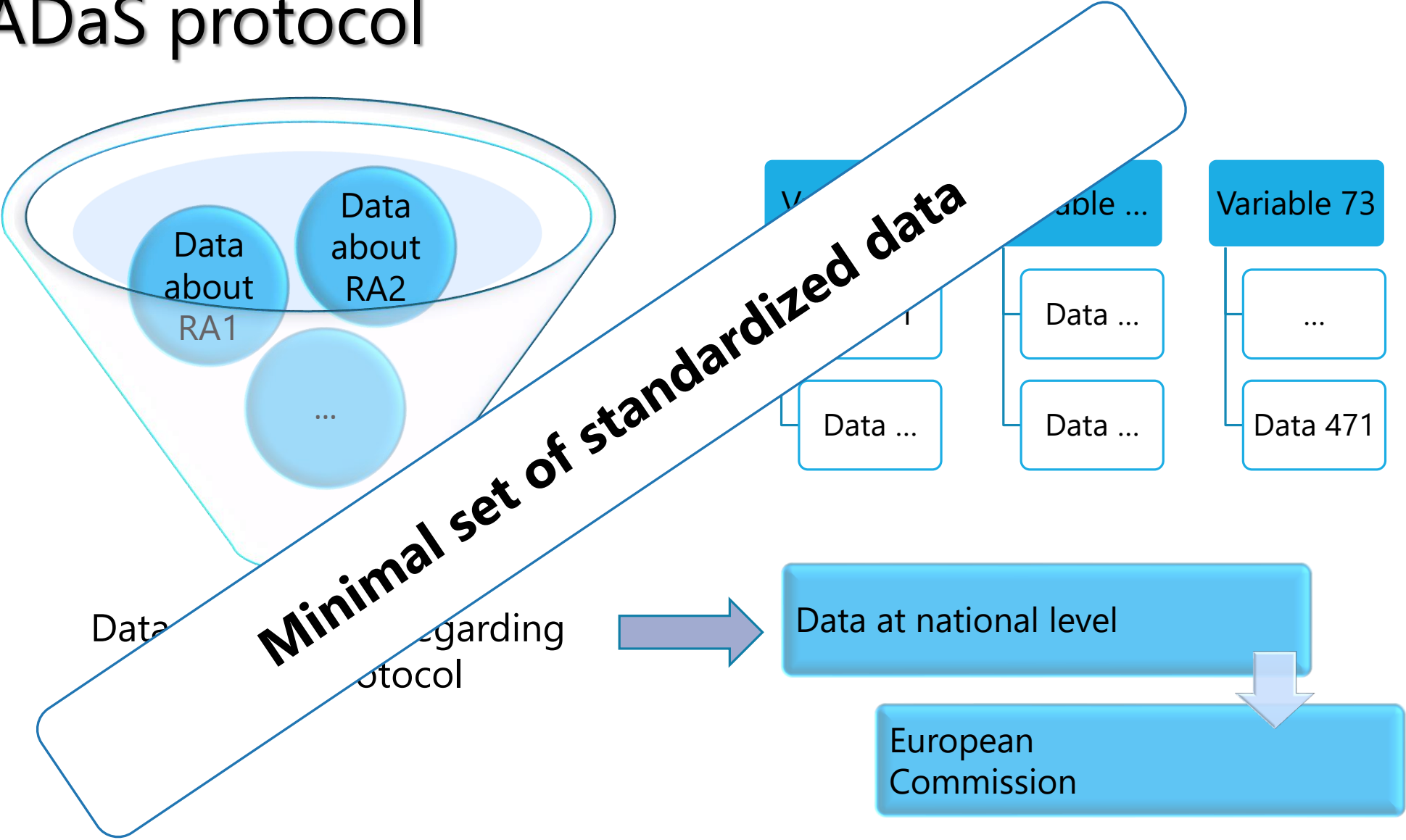
Community Road Accident Database - CARE



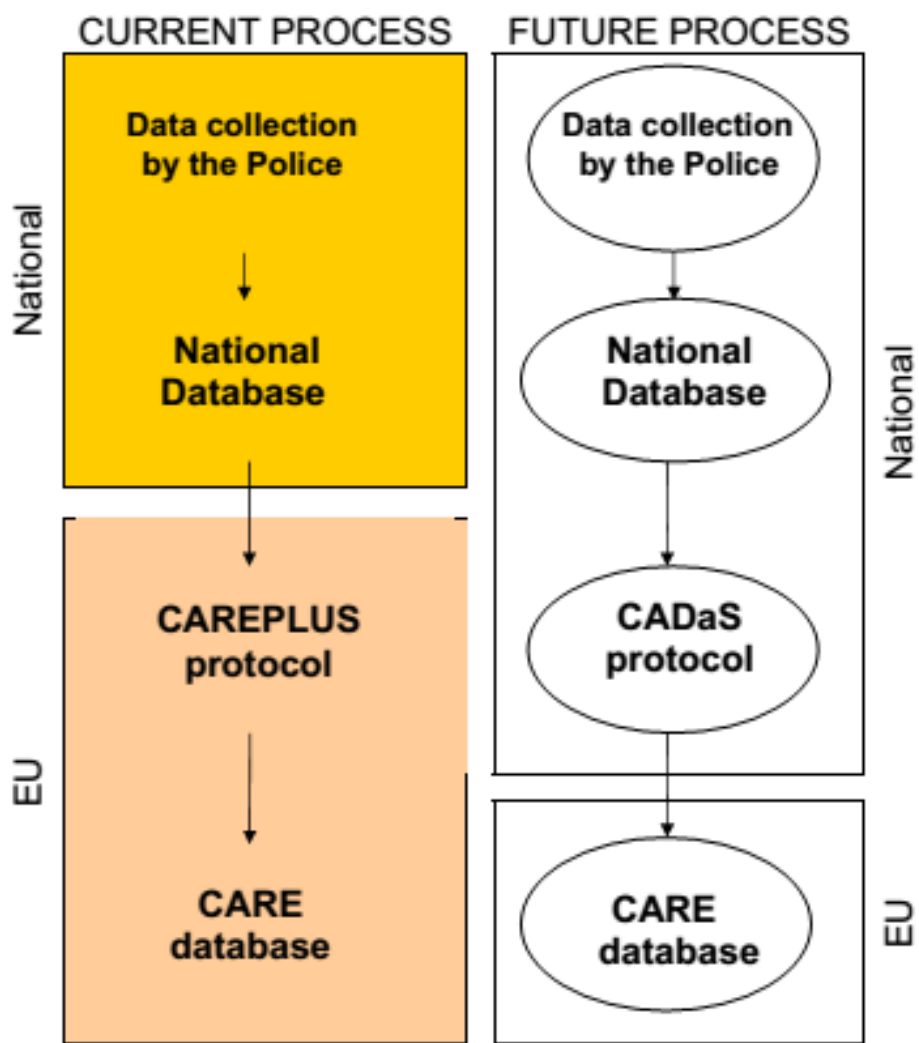
CADaS

(Common Accident Data Set)

CADaS protocol



CURRENT AND FUTURE PROCESSES



Minimum set of standardized data elements

More variables and values with a common definition in CARE database

Comparable road accident data in Europe

More detailed and reliable analyses at European level

CADaS (Common Accident Data Set) protocol

SCOPE

- The **Common Accident Data Set (CADaS)** allows for comparable road accident data to be available in Europe, as is the case at Federal level in the United States of America (MMUCC).
- The **CADaS** system will be implemented by the EU Member States:
 - on a voluntary basis
 - in pieces ("a la carte" system)
 - gradually

PURPOSE

- CARE will contain increasingly more compatible and comparable data.
- More common road accident data from the EU countries will be available to the European Road Safety Community.



CADaS (Common Accident Data Set) protocol

VARIABLE CATEGORIES

The **CADaS** variables are divided into four basic categories, identified by a unique letter (code) at the beginning of the name of the respective variable:

A, for **Accident** related variables,

R, for **Road** related variables,

V, for **Vehicle** related variables,

P, for **Person** related variables

Example: **A-2 ACCIDENT DATE**



CADaS (Common Accident Data Set) protocol

VARIABLE RATING

At a first stage, each country can adopt (if they wish) only a subset of variables of the CADaS. This selection can be based on the importance of the recommended variables.

For that reason, all variables were separated into two broad categories, according to their importance for road accident analysis, as estimated by the WP1 partners:

- **Variables of high importance (H)**
- **Variables of lower importance (L)**



Basic CADaS structure



I Accident related variables



II Road related variables



III Traffic Unit (vehicle and pedestrian) related variables



IV Person related variables

CADaS variables

Accident

ACCIDENT ID
 ACCIDENT DATE
 ACCIDENT TIME
 NUTS
 LAU
 WEATHER CONDITIONS
 LIGHT CONDITIONS
 ACCIDENTS WITH PEDESTRIANS
 ACCIDENTS WITH PARKED VEHICLES
 SINGLE VEHICLE ACCIDENTS
 AT LEAST TWO VEHICLES - NO TURNING
 AT LEAST TWO VEHICLES - TURNING OR CROSSING
 HIT & RUN ACCIDENT

13

Road

ACCIDENT ID
 LATITUDE
 LONGITUDE
 E-ROAD
 E-ROAD KILOMETRE
 FUNCTIONAL CLASS - 1st ROAD
 FUNCTIONAL CLASS - 2nd ROAD
 SPEED LIMIT - 1st ROAD
 SPEED LIMIT - 2nd ROAD
 MOTORWAY
 URBAN AREA
 JUNCTION
 RELATION TO JUNCTION / INTERCHANGE
 JUNCTION CONTROL
 SURFACE CONDITIONS
 OBSTACLES
 CARRIAGEWAY TYPE
 NUMBER OF LANES
 EMERGENCY LANE
 MARKINGS
 TUNNEL
 BRIDGE
 WORK ZONE RELATED
 ROAD CURVE
 ROAD SEGMENT GRADE

25

Traffic unit

ACCIDENT ID
 TRAFFIC UNIT ID
 TRAFFIC UNIT TYPE
 VEHICLE SPECIAL FUNCTION
 TRAILER
 ENGINE POWER
 ACTIVE SAFETY EQUIPMENT
 VEHICLE DRIVE
 MAKE
 MODEL
 REGISTRATION YEAR
 TRAFFIC UNIT MANOEUVRE
 FIRST POINT OF IMPACT
 FIRST OBJECT HIT IN
 FIRST OBJECT HIT OFF
 VEHICLE INSURANCE FOR DRIVER/RIDER
 HIT & RUN
 REGISTRATION COUNTRY

18

Person

ACCIDENT ID
 TRAFFIC UNIT ID
 PERSON ID
 DATE OF BIRTH
 GENDER
 NATIONALITY
 INJURY SEVERITY
 ROAD USER TYPE
 ALCOTEST
 ALCOTEST SAMPLE TYPE
 ALCOTEST RESULT
 ALCOHOL LEVEL
 DRUG TEST
 DRIVING LICENSE ISSUE DATE
 DRIVING LICENSE VALIDITY
 SAFETY EQUIPMENT
 POSITION IN/ON VEHICLE
 DISTRACTED BY DEVICE
 PSYCOPHYSICAL / PHYSICAL IMPAIRMENT OR CONDITION
 TRIP/JOURNEY PURPOSE
 INJURY MAIS SCALE

21

Basic CADaS structure + Contributory factors

1. Data about road accidents



2. Data about road



3. Data about road users



4. Data about persons



5. Contributory factors

	101	102	103	104
1. Причина дорожно-транспортного происшествия	101.1	101.2	101.3	101.4
2. Место происшествия	102.1	102.2	102.3	102.4
3. Время происшествия	103.1	103.2	103.3	103.4
4. Погода	104.1	104.2	104.3	104.4

**CADaS – proposed by
European Commission**
(Common Accident Data Set)



Road accidents
causes

Contributory
factors

9 groups

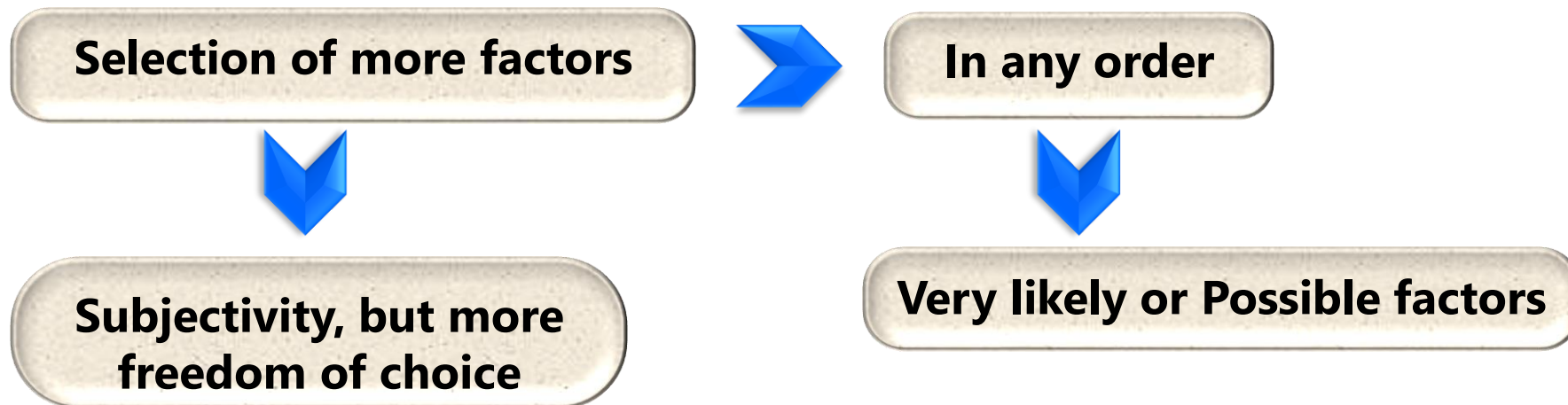
84 contributory factors

Road Environment Contributed	101	102	103	104	105	106	107	108	109	
	Poor or defective road surface	Deposit on road (e.g. oil, mud, chippings)	Slippery road (due to weather)	Inadequate or masked signs or road markings	Defective traffic signals	Traffic calming (e.g. speed cushions, road humps, chicanes)	Temporary road layout (e.g. contraflow)	Road layout (e.g. bend, hill, narrow carriageway)	Animal or object in carriageway	
Vehicle Defects	201	202	203	204	205	206				
	Tyres illegal, defective or under-inflated	Defective lights or indicators	Defective brakes	Defective steering or suspension	Defective or missing mirrors	Overloaded or poorly loaded vehicle or trailer				
Injudicious Action	301	302	303	304	305	306	307	308	309	310
	Disobeyed automatic traffic signal	Disobeyed 'Give Way' or 'Stop' signs or markings	Disobeyed double white lines	Disobeyed pedestrian crossing facility	Illegal turn or direction of travel	Exceeding speed limit	Travelling too fast for conditions	Following too close	Vehicle travelling along pavement	Cyclist entering road from pavement
Driver/Rider Error or Reaction	401	402	403	404	405	406	407	408	409	410
	Junction overshoot	Junction restart (moving off at junction)	Poor turn or manoeuvre	Failed to signal or misleading signal	Failed to look properly	Failed to judge other person's path	Passing too close to pedestrian	Sudden braking	Swerved	Loss of control
Impairment or Distraction	501	502	503	504	505	506	507	508	509	510
	Impaired by alcohol	Impaired by drugs (illicit or medicinal)	Fatigue	Uncorrected, defective eyesight	Illness or disability, mental or physical	Not displaying lights at night or in poor visibility	Cyclist wearing dark clothing at night	Driver using mobile phone	Distraction in vehicle	Distraction outside vehicle
Behaviour or Inexperience	601	602	603	604	605	606	607			
	Aggressive driving	Careless, reckless or in a hurry	Driving too fast for conditions or slow vehicle (e.g. tractor)	Learner or inexperienced driver/rider	Inexperience of driving on the left	Unfamiliar with model of vehicle				
Vision Affected by	701	702	703	704	705	706	707	708	709	710
	Stationary or parked vehicle(s)	Vegetation	Road layout (e.g. bend, winding road, hill crest)	Buildings, road signs, street furniture	Dazzling headlights	Dazzling sun	Rain, sleet, snow or fog	Spray from other vehicles	Visor or windscreen dirty or scratched	Vehicle blind spot
Pedestrian Only (Casualty or Uninjured)	801	802	803	804	805	806	807	808	809	810
	Crossing road masked by stationary or parked vehicle	Failed to look properly	Failed to judge vehicle's path or speed	Wrong use of pedestrian crossing facility	Dangerous action in carriageway (e.g. playing)	Impaired by alcohol	Impaired by drugs (illicit or medicinal)	Careless, reckless or in a hurry	Pedestrian wearing dark clothing at night	Disability or illness, mental or physical
Special Codes	901	902	903	904						*999
	Stolen vehicle	Vehicle in course of crime	Emergency vehicle on a call	Vehicle door opened or closed negligently						Other – Please specify below

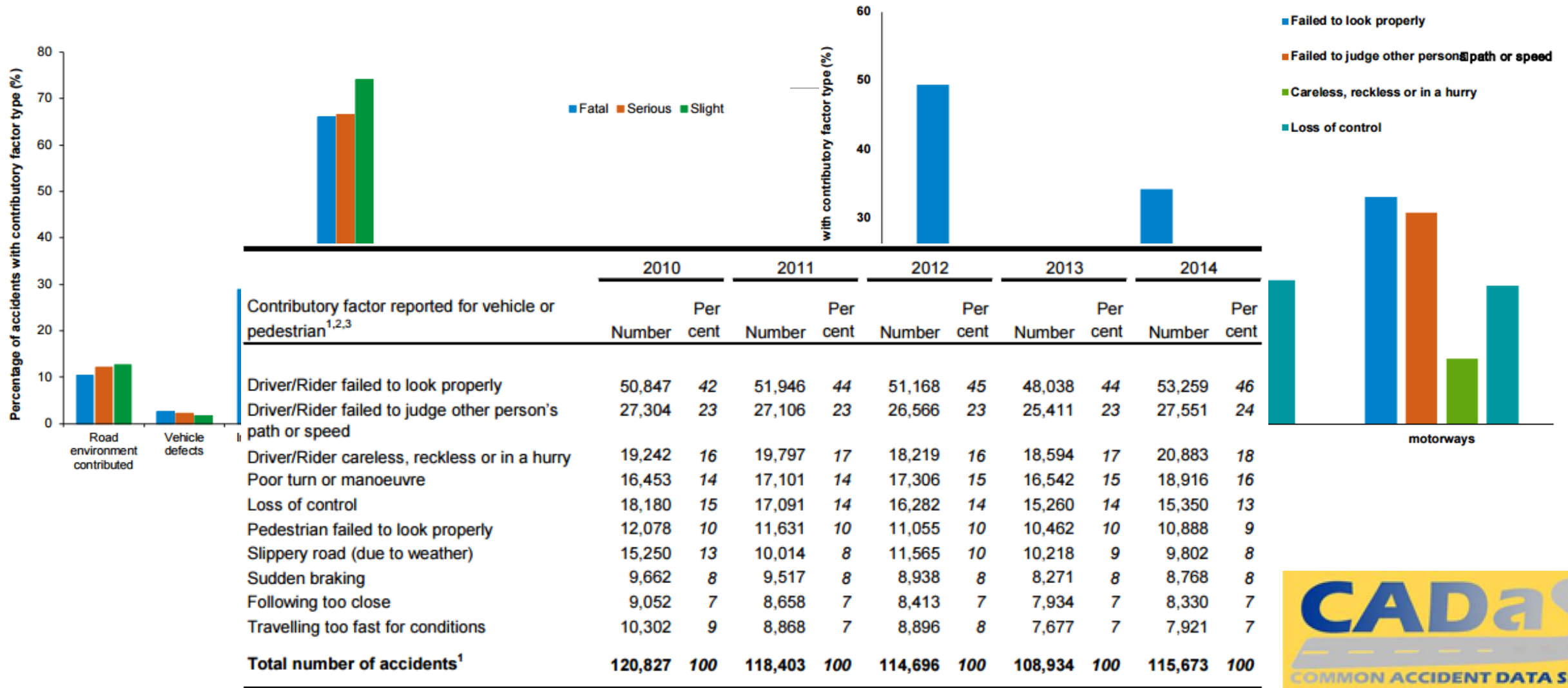
CONTRIBUTORY FACTORS:
events and actions that have direct or indirect impact on the occurrence of road accidents



Britain model of contributory factors (STATS)



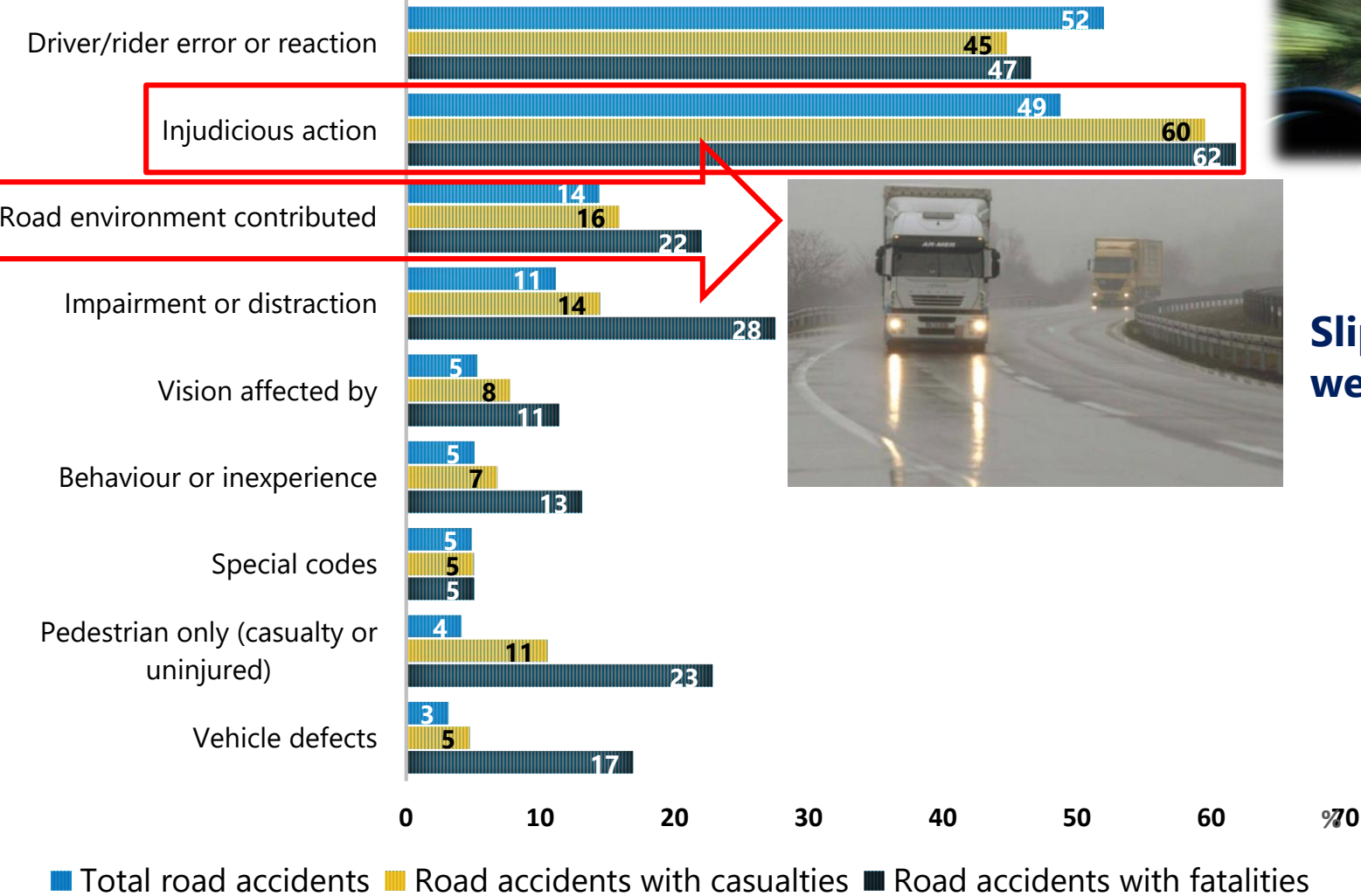
Analysis of contributory factors



Analysis of contributory factors



Travelling too fast
for traffic and road
conditions



Slippery road due to
weather condition





ACCIDENTS WITH PEDESTRIANS

ACCIDENTS WITH PARKED VEHICLES



SINGLE VEHICLE ACCIDENTS

AT LEAST TWO VEHICLES - NO TURNING

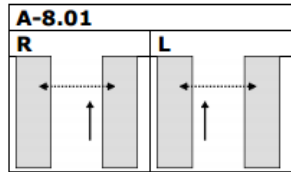


AT LEAST TWO VEHICLES - TURNING OR CROSSING

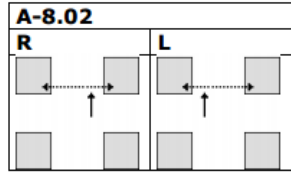
Road accident types



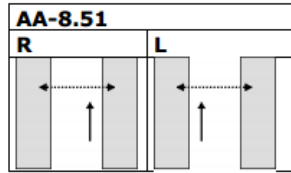
ACCIDENTS WITH PEDESTRIANS SKETCHES



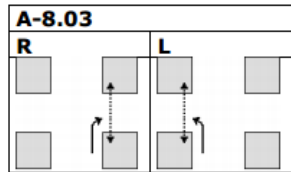
Pedestrian crossing street – no turning of vehicle - outside a junction



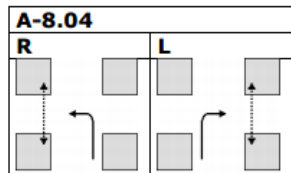
Pedestrian crossing street – no turning of vehicle - at a junction



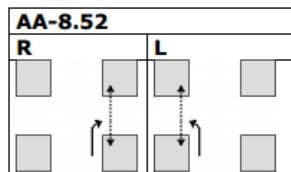
Pedestrian crossing street - no turning of vehicle – not specified



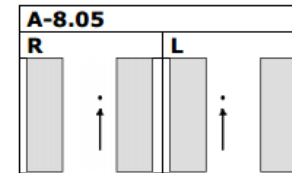
Pedestrians crossing - turning of vehicle turning right (left)



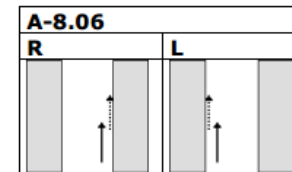
Pedestrians crossing - turning of vehicle turning left (right)



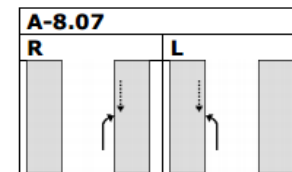
Pedestrians crossing - turning of vehicle – not specified



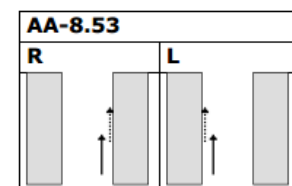
Pedestrian stationery in the road



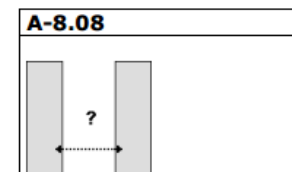
Pedestrian walking along the road



Pedestrians on pavement or bicycle lane

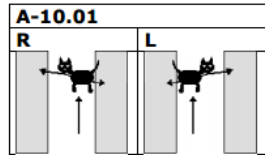


Pedestrian walking along the road or stationary in the road

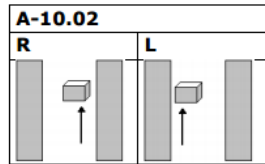


Pedestrian others

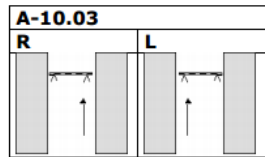
SINGLE VEHICLE ACCIDENTS SKETCHES



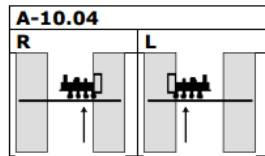
Single vehicle accidents with animals



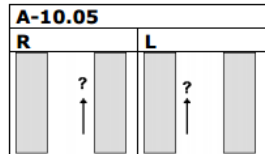
Single vehicle accidents with obstacles on or above the road



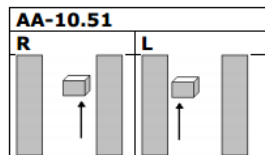
Single vehicle accidents with roadwork materials



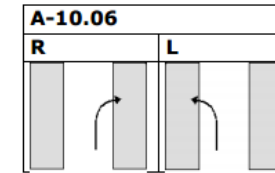
Accidents between train and vehicle



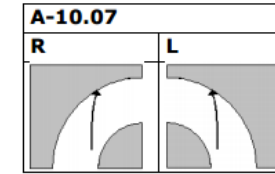
Single vehicle accidents with obstacles - others



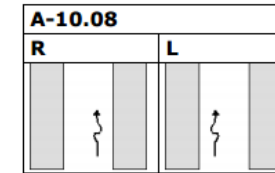
Single vehicle accidents with obstacles on the road - not specified



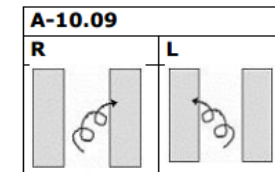
Single vehicle accident - Leaving straight road - either side of the road



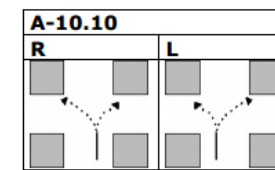
Single vehicle accidents in a bend - going either side of the road



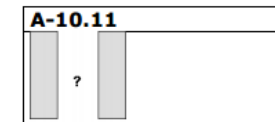
Single vehicle accidents on the road



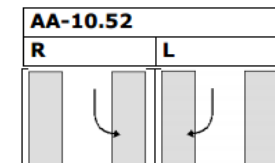
Single vehicle accidents including rollover



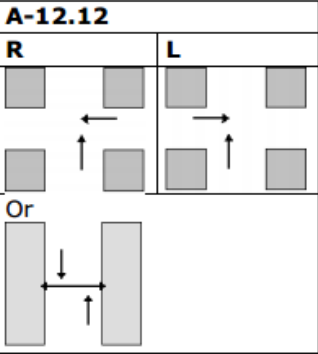
Single vehicle accidents in junctions or entrances



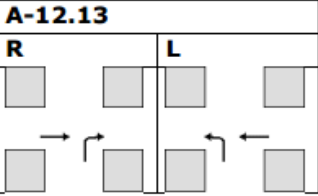
Single vehicle accidents without obstacles - others



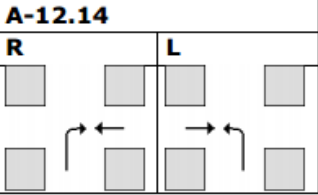
Single vehicle accidents without obstacles on the road



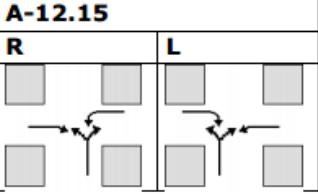
At least two vehicles - crossing (no turning) - different roads



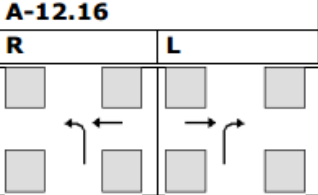
At least two vehicles - different roads - turning right (left) in front of vehicle from the left (right)



At least two vehicles - different roads - turning right (left) - head on collision

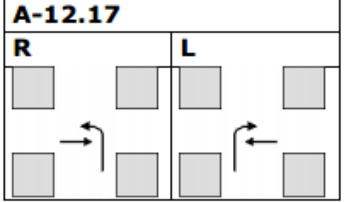


At least two vehicles - different roads - both vehicles turning

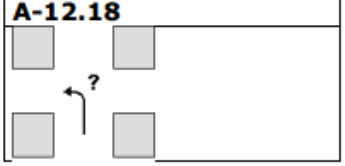


At least two vehicles - different roads - turning left (right) into traffic from the right (left) side

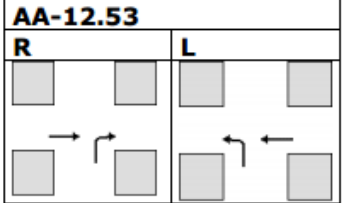
AT LEAST TWO VEHICLES - TURNING OR CROSSING SKETCHES



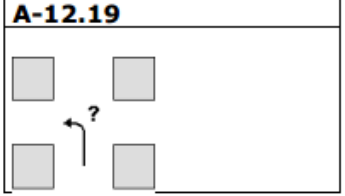
At least two vehicles - different roads - turning left (right) into traffic from the left (right) side



At least two vehicles - different roads - turning into traffic - others



At least two vehicles - turning - different roads - not specified



At least two vehicles - crossing or turning - others

Importance of CADaS in practice

Independent evaluation of the road impact on the occurrence and the consequences of the road accident

- What happened?
- Where?
- What are the causes and the circumstances?

**OUT THE SCENE
ON THE SCENE**

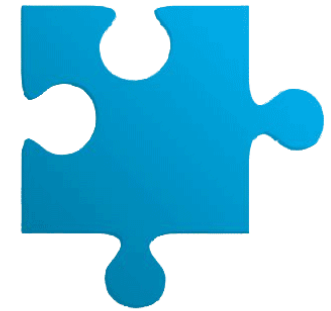
Have ROAD and ROAD ENVIRONMENT contributed to the occurrence and consequences of road accident

The possibility of avoiding the accident

Serbian experience in contributory factors analyses



„Road and road environment contributed“
22% in fatal road accidents



(Source: Kukić et al., Serbia, 2016)

Importance of CAdaS in practice

TYPE - head on collisions

Maneuver -
Overtaking vehicle

Single carriageway -
two way street

Speed limit 80
km/h

Outside urban
area

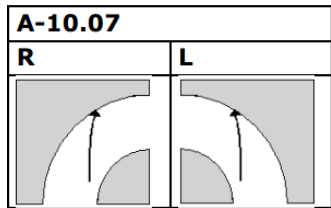


**Construction of auxiliary
passing lanes**



Importance of CADaS in practice

TYPE - single vehicle accident in a bend



Curve

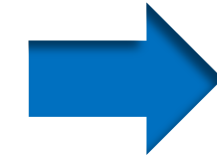
Maneuver - Straight forward / normal driving

Outside urban area
Speed limit 80 km/h

Markings – only separating lanes

Single carriageway - two way street

Vehicle hit a tree after leaving the carriageway



MEASURES



Importance of CADaS in practice

TYPE - Pedestrian crossing street – outside a junction

Maneuver - Crossing (on pedestrian crossing)

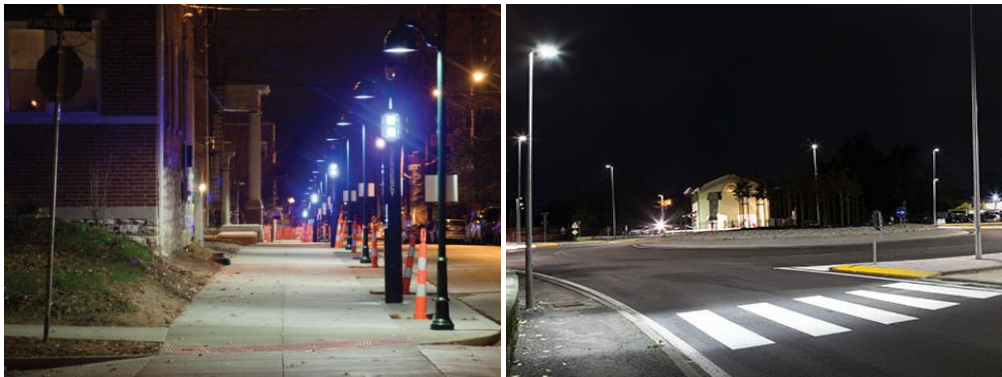
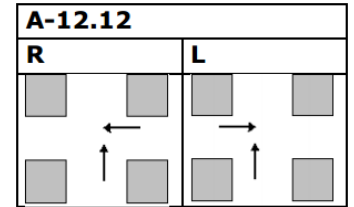
Light conditions - Darkness street lights unlit

TYPE - At least two vehicles - crossing (no turning) - different roads

Maneuver - Straight forward/normal driving

Junction – At-grade - crossroad

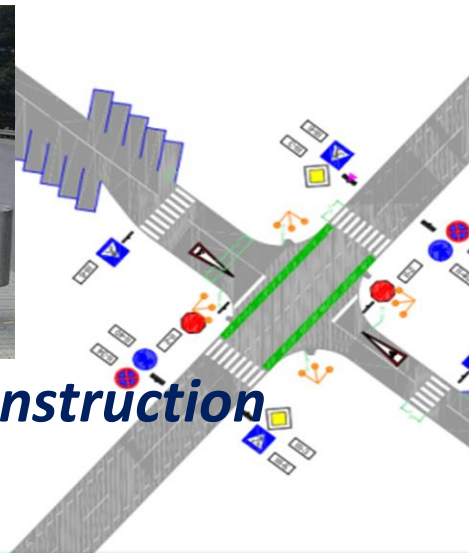
Bicyclist involved



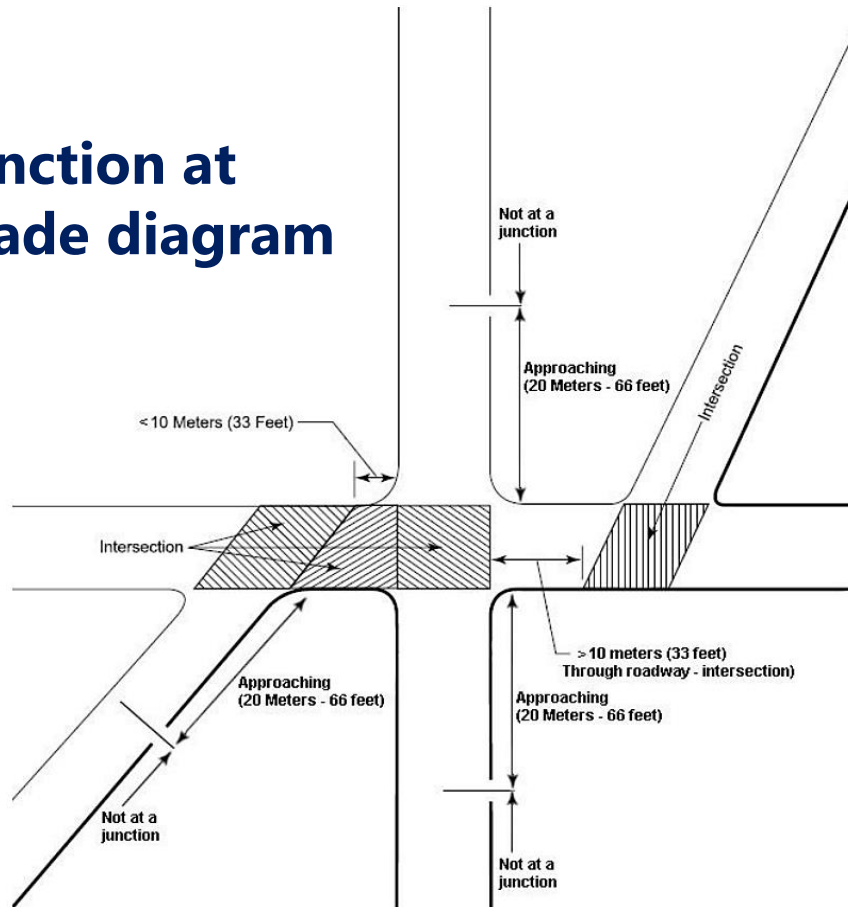
Lighting improvements at pedestrian crossings



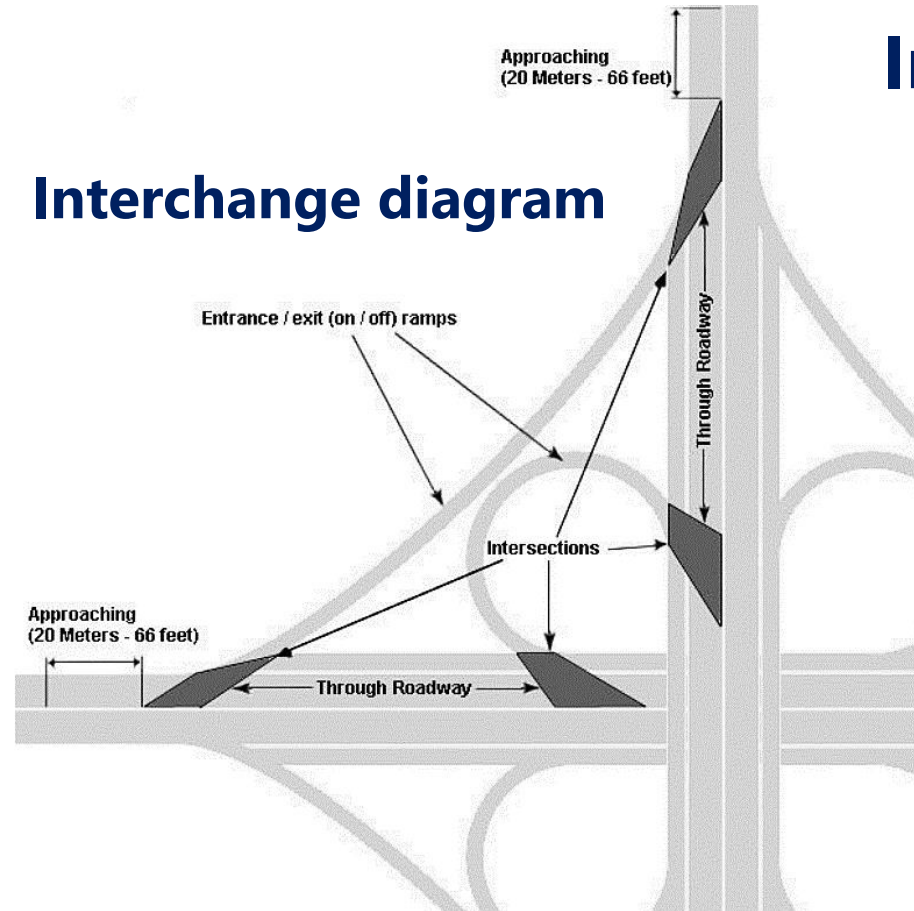
Bike lane and path construction and marking



Junction at grade diagram



Interchange diagram



Importance of CADaS in practice

RELATION TO JUNCTION / INTERCHANGE

- ❑ Indicates the exact site of the junction / interchange where the accident occurred
- ❑ **Important for site-specific safety studies** to identify actual or potential safety problem locations



Importance of CADaS in practice

OBSTACLES

Indicates the presence of obstacles on the carriageway

YES

Road obstacle(s) was (were) present at the accident site

NO

No road obstacle(s) was (were) present at the accident site

- ☐ Includes any **animal standing or moving** (either hit or not) within the carriageway
- ☐ Includes **any object not supposed to be on the road**, which obstructed the movement of the traffic unit(s)



Importance of CADaS in practice

FIRST OBJECT HIT IN CARRIAGE WAY

None
Object from previous accident
Parked vehicle
Bridge
Bollard/refuge
Central island of roundabout
Kerb
Animal (except ridden animal)
Other object
Train

FIRST OBJECT HIT OFF CARRIAGE WAY

Road sign/traffic signal
Lamp post
Pole
Tree
Bus stop/shelter
Central crash barrier
Crash barrier beside carriageway
Ditch
Parked vehicle
Stone/rock/mountain side
Fence
Submerged in water
Other permanent object



***THANK YOU FOR
YOUR ATTENTION!***

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World Bank