

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)

DRAGOSLAV KUKIĆ, PHD.

INTERNATIONAL CRASH DATA AND ROAD SAFETY SPECIALIST



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
- ...



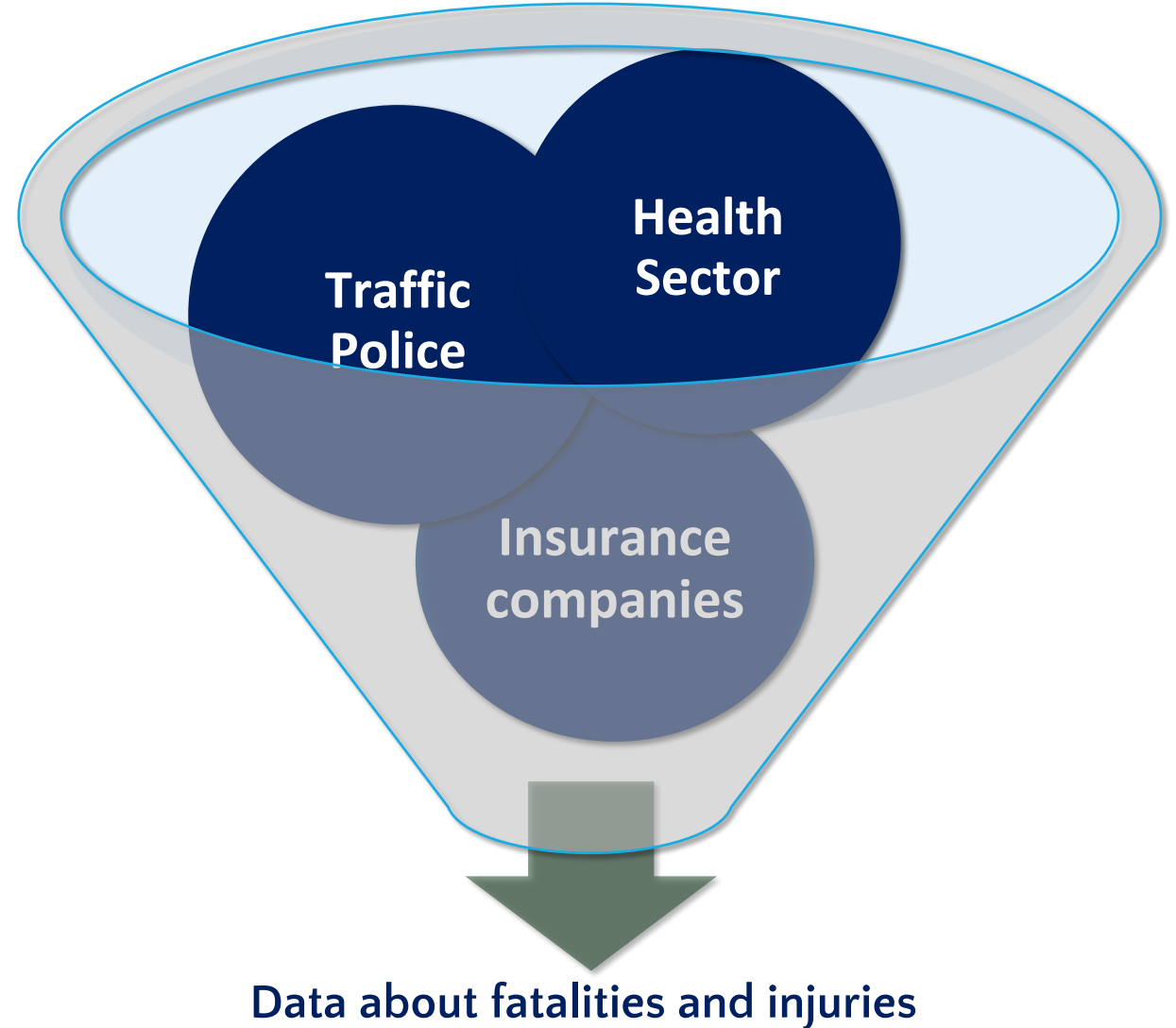
Road Accidents Database types

- 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)

IRTAD
International Traffic Safety Data and Analysis Group

Home About Forum 2011 Research ECMT Press Webcast

Google Site Search

Topics: About IRTAD, Group Activities, Members, Database Coverage, Data Sets, Documents

Practical Information: Membership

Latest publication: **Reporting on Serious Road Traffic Casualties**
Combining and using different data sources to improve understanding of non-fatal road traffic crashes. This special IRTAD report was prepared by a Working Group on Linking Police and Hospital Data with a view to identify and assess methodologies for linking different sources of accident data in order to develop better estimates of the real number of road traffic casualties. Free download (pdf).

Related Sites: ERSO, GRSP, UNECE Statistics, UNESCAP, World Bank

International Transport Forum at the World Bank, the Ministries of Health of Spain and Argentina, and the Ministry of Health of Mexico have agreed to set up an institutional network and a road safety observatory for Latin American countries, supported by a high-quality road traffic database and a web-based knowledge system.

2008, the Forum has sought to expand the coverage of its International Road Traffic Accident Database (IRTAD) on road safety in assist low- and middle-income and transition countries in developing adequate road safety data. For more information, please contact our mailing list for related Press Releases.

IRTAD Database, July 2011 -- Exposure Data

	Year (at 1st January)	Home population (in 1 000)	Year (at 1st January)	Network length of all public roads (in km)	whereof motorways	Year (at 1st January)	Number of Motor vehicles (in 1000)	whereof powered two wheelers**	whereof passenger cars	Area of state (in sqkm)
Australia	2009	22629	2009	617898	1896	2009	15674	624	10523	7660248
Austria	2009	8372	2009	115006	1696	2009	5675	685	4365	83671
Belgium	2009	10348	2009	150995	1763	2009	4445	398	1111	30542
Canada	2009	34109	2009	1409600	16900	2009	21367	569	16896	9984170
Czech Republic	2009	10767	2009	55719	778	2009	5795	903	4435	78962
Denmark	2009	5208	2009	7481	140	2009	279	164	2162	43200
Finland	2009	5351	2009	78161	702	2009	3248	456	2777	308143
France	2009	62793	2009	1027944	11941	2009	38749	2557	30947	641709
Germany	2009	81823	2009	144209	17645	2009	61144	1376	41738	357000
Great Britain	2009	60000	2009	364426	3302	2009	34175	292	28429	272998
Greece	2009	11305	2009	31465	1095	2009	7911	3000	5112	131944
Hungary	2009	10314	2009	31465	1095	2009	3946	142	3055	93033
Iceland	2009	318	2009	318	0	2009	203	0	0	103229
Ireland	2009	4485	2009	1659	0	2009	2868	0	0	70923
Italy	2009	60343	2009	1659	0	2009	3243	117	1471	301418
Japan	2009	127110	2009	120377	0	2009	10061	0	0	378000
Korea	2009	45147	2009	92	0	2009	267	0	0	100000
Luxembourg	2009	502	2009	267	0	2009	0	0	0	16000
Netherlands	2009	16272	2009	41718	0	2009	0	0	0	41500
New Zealand	2009	4199	2009	0	0	2009	0	0	0	268000
Norway	2009	4595	2009	0	0	2009	0	0	0	385000
Poland	2009	38167	2009	34453	0	2009	0	0	0	312000
Portugal	2009	10538	2009	0	0	2009	0	0	0	92000
Romania	2009	2047	2009	2000	0	2009	0	0	0	238000
Spain	2009	45685	2009	66795	0	2009	0	0	0	505000
Sweden	2009	934	2009	22980	0	2009	0	0	0	450000
Switzerland	2009	7798	2009	0	0	2009	0	0	0	41000
United Kingdom	2009	61789	2009	4198	0	2009	0	0	0	244000
USA	2009	308744	2009	648007	0	2009	0	0	0	9500000

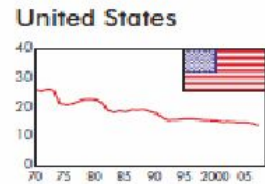
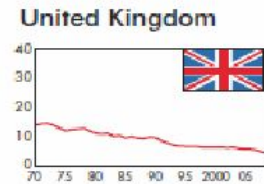
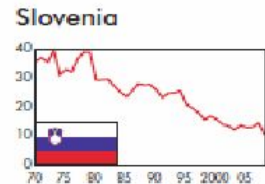
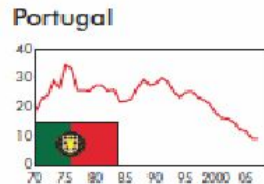
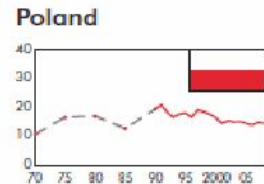
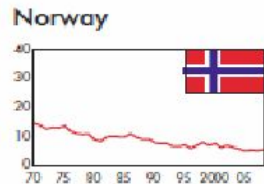
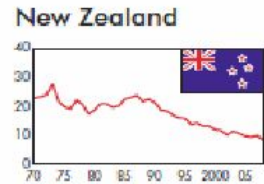
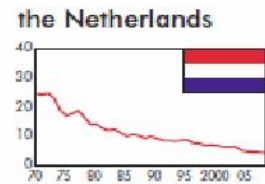
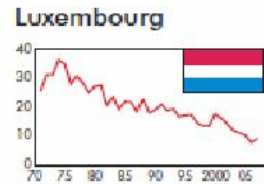
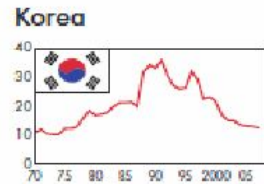
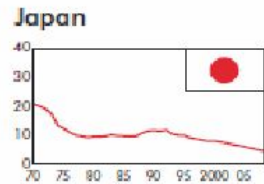
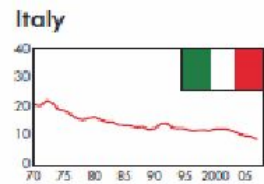
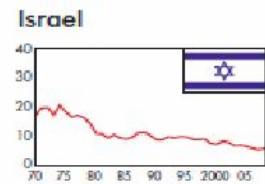
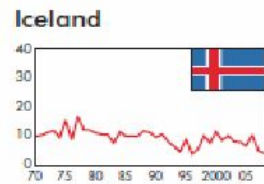
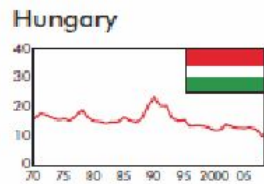
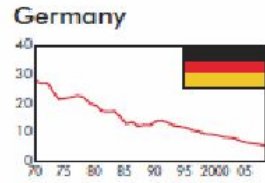
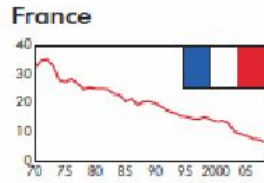
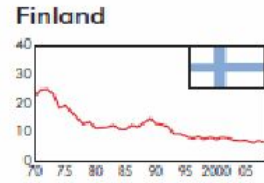
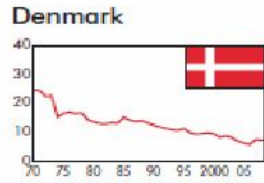
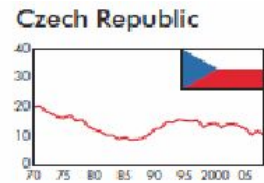
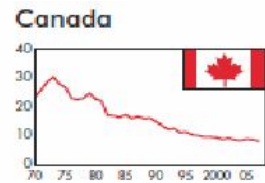
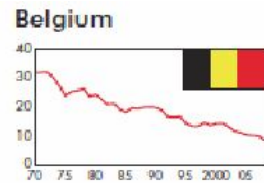
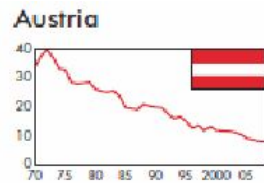
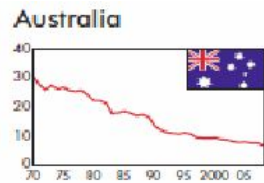
* some countries have different reference dates, e.g. mid year
** without mopeds/motors



International Traffic Safety Data and Analysis Group

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

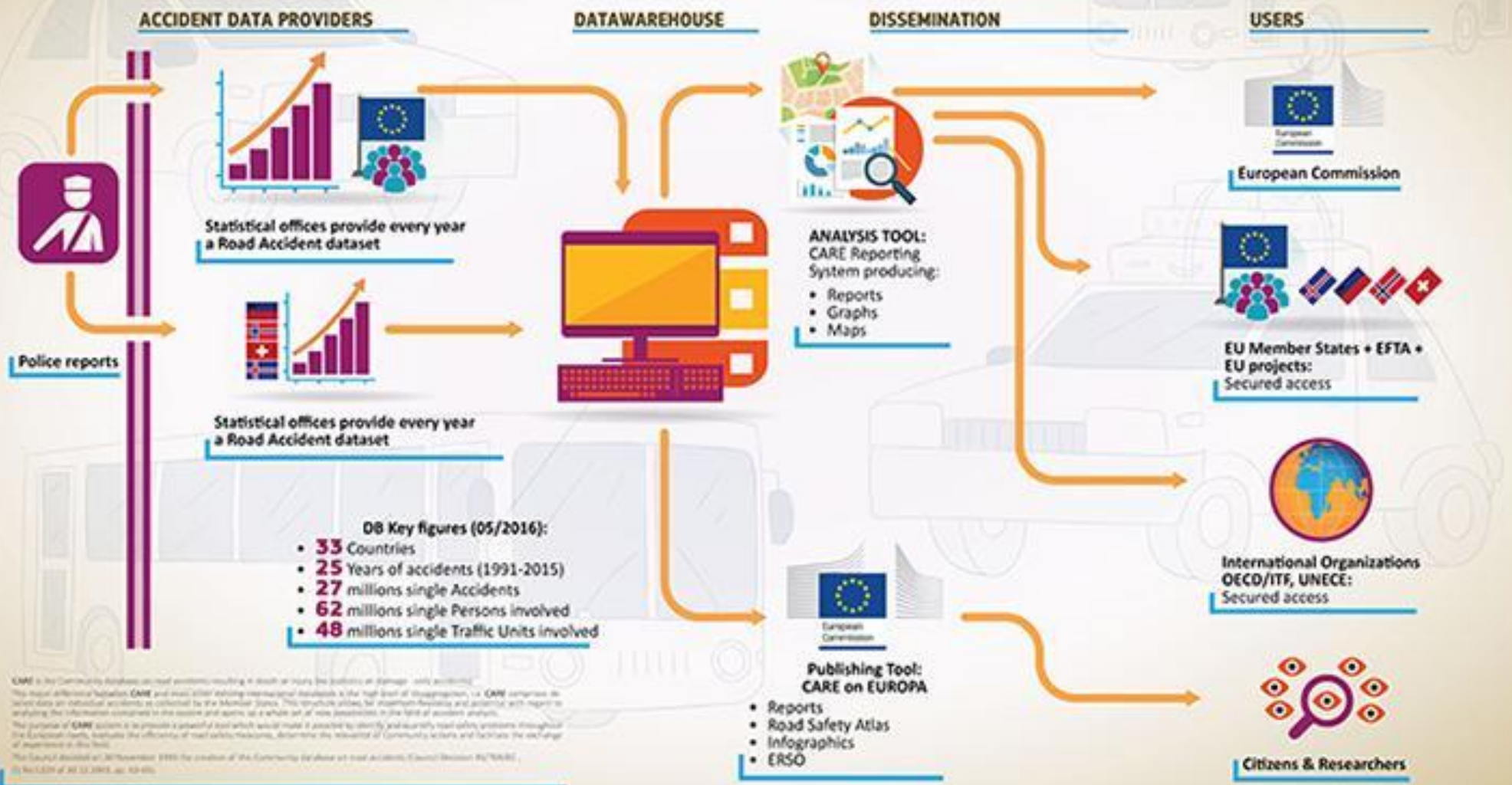


International Traffic Safety
Data and Analysis Group

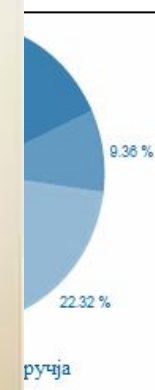


Community Road Accident Database - CARE

CARE: The European Union's road accidents database



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



CARE is the Community database on road accidents resulting in death or injury, the property or damage, and accidents. This report reflects the data collected by the Member States. This structure allows for comparison and analysis with regard to road safety. The information contained in this report is for general information only and should not be used as a basis for any legal action. The purpose of CARE is to provide a general overview of road accidents in the EU and to identify and quantify road safety problems throughout the European territory, evaluate the effectiveness of road safety measures, determine the relevance of Community actions and facilitate the exchange of information in this field. This report is based on the 2015 data. © 2016 European Commission. All rights reserved. (EUROPEAN COMMISSION, 2016)

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

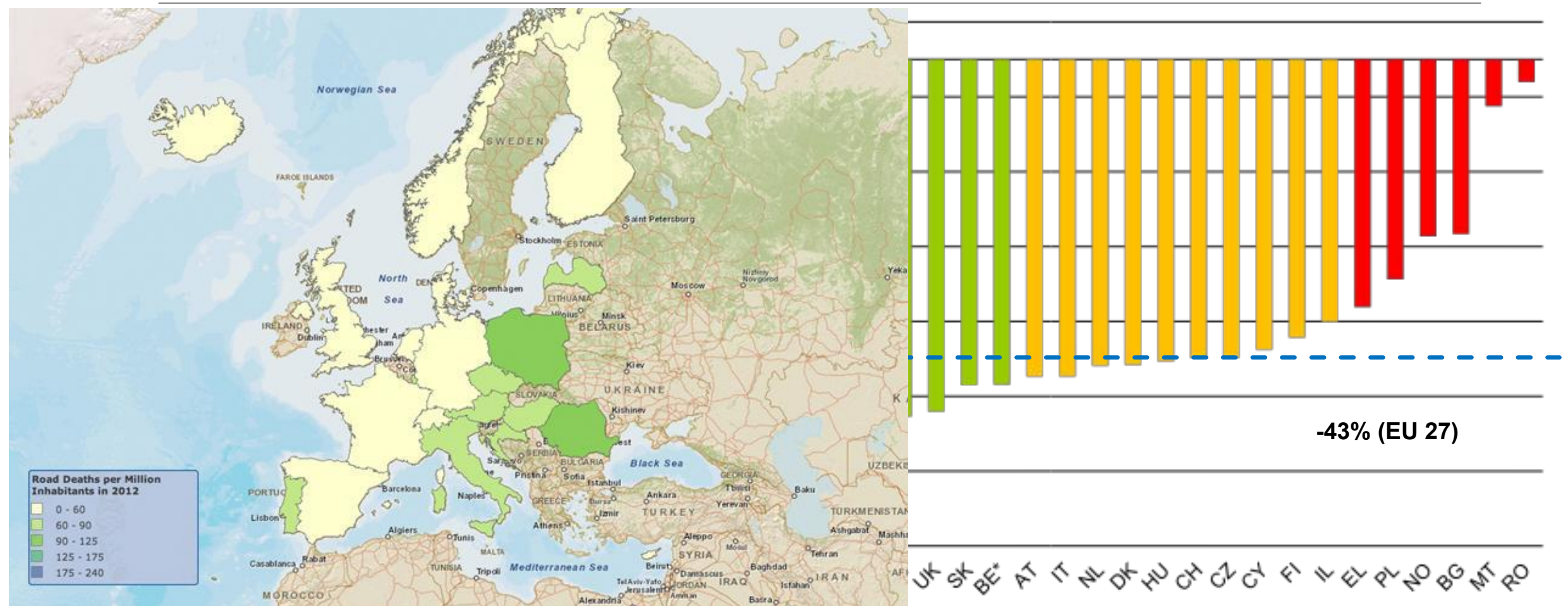


Community Road Accident Database – CARE

- 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

- Data about RA2
- Data about RA1
- ...
- Data transformed regarding CADaS protocol

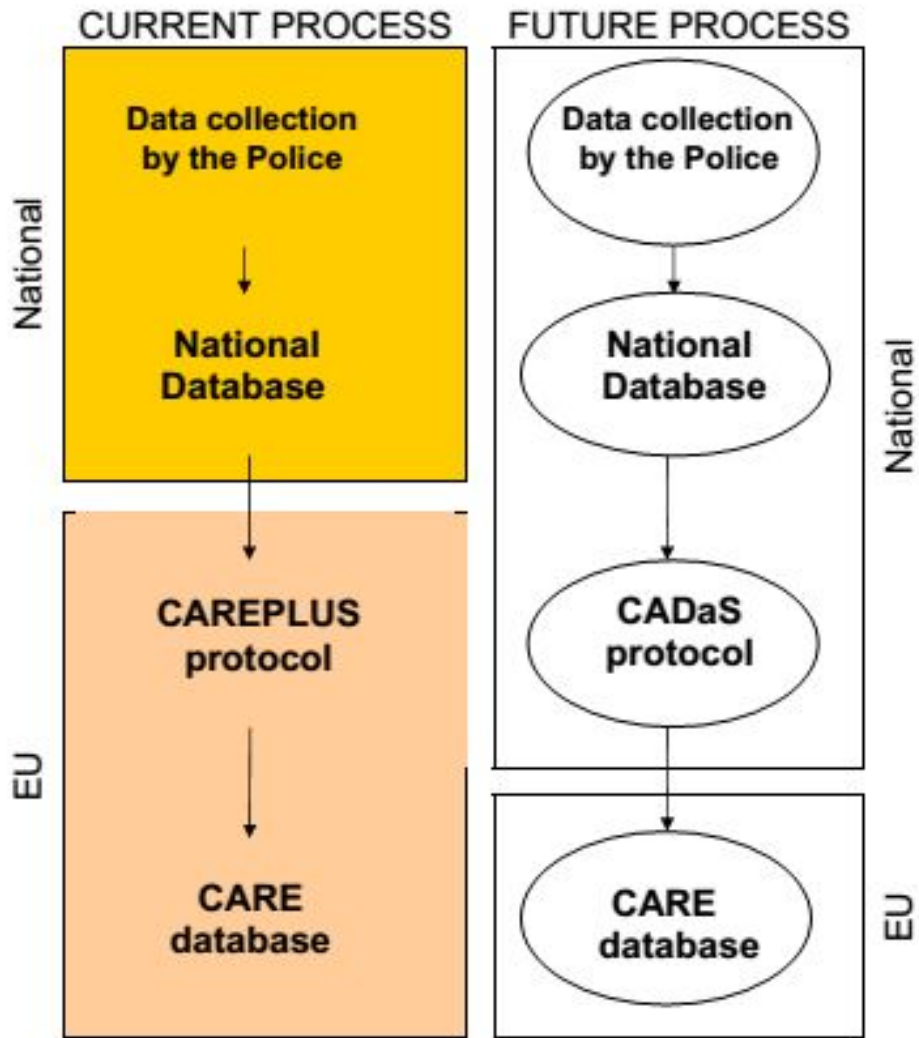
**Minimal set
of
standardized
data**



- Variable 1
 - Data 1
 - Data ...
- Variable ...
 - Data ...
 - Data ...
- Variable 73
 - ...
 - Data 471

- Data at national level
- European Commission

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)**



CADaS (Common Accident Data Set) protocol

VARIABLE COMPONENTS

Variable Label:

- Section identifier (A, R, V or P)
- Numbering and Name
- Variable rating (H or L)

Variable definition and scope:

- Variable definition
- Brief description
- Importance and usefulness (rational lying behind its selection)

Values list



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

Road accidents causes

Contributory factors

9 groups

84 contributory factors

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

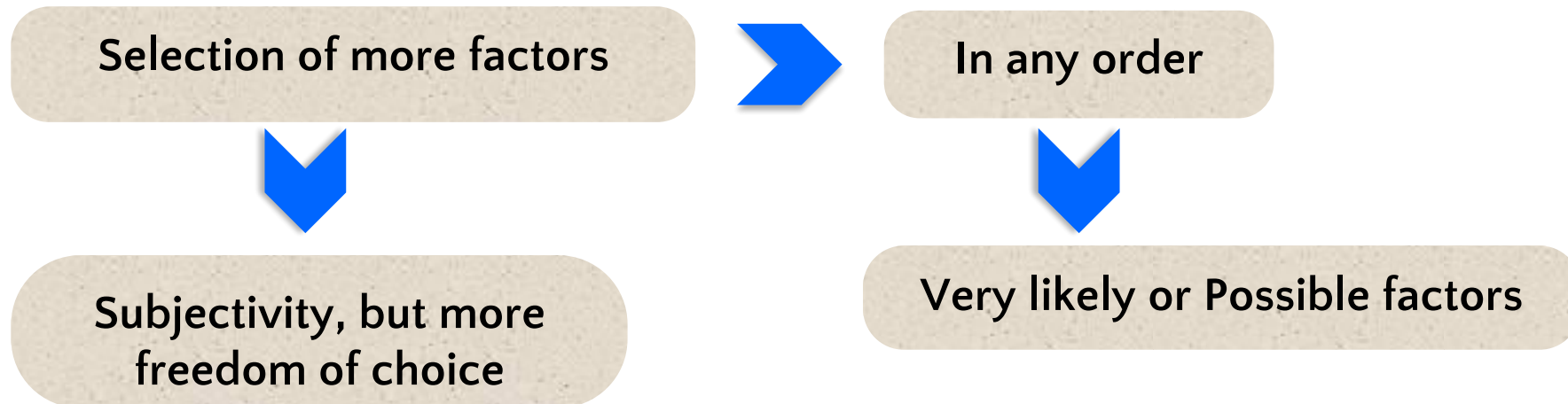
·CAUSES



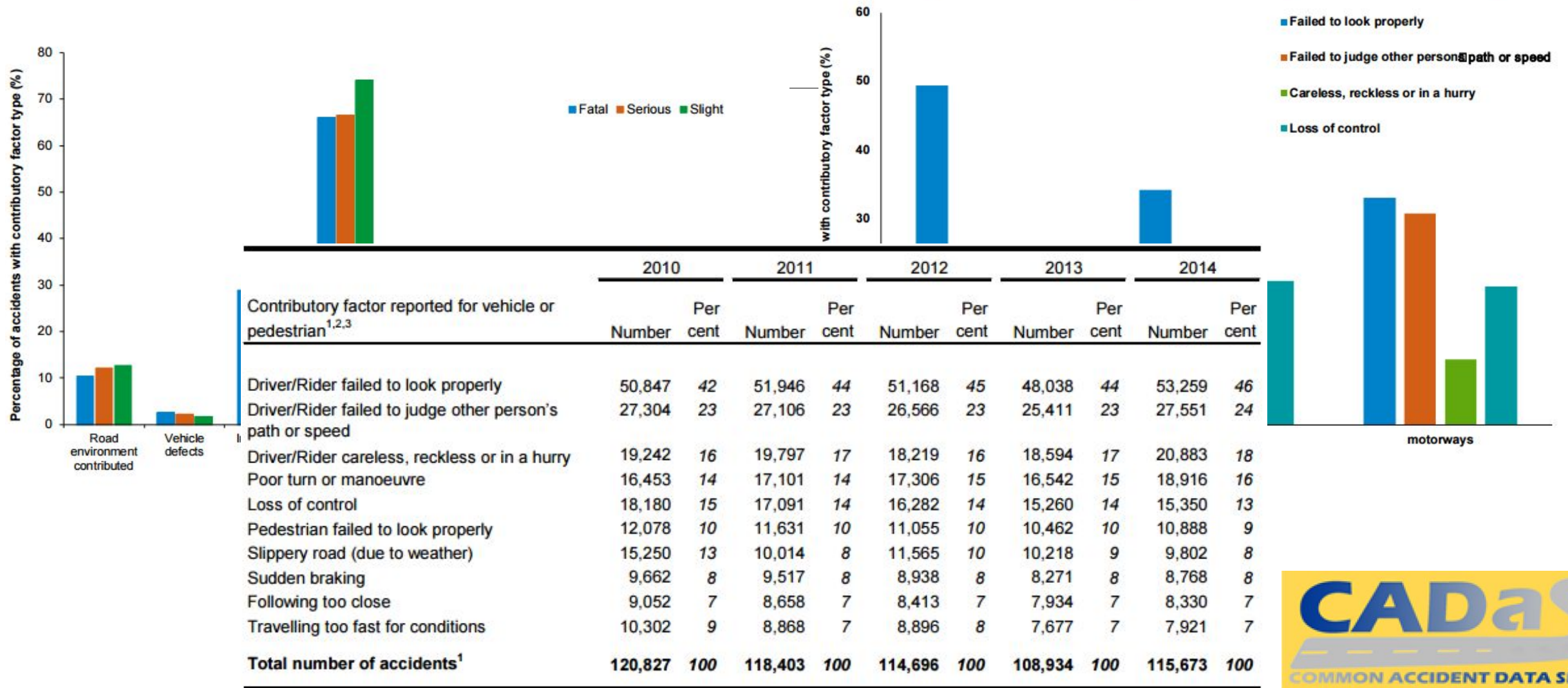
events and actions that have direct or indirect

·CONTRIBUTORY FACTORS

impact on the occurrence of road accidents



Analysis of contributory factors



(Source: Department for Transport, Great Britain, 2014)

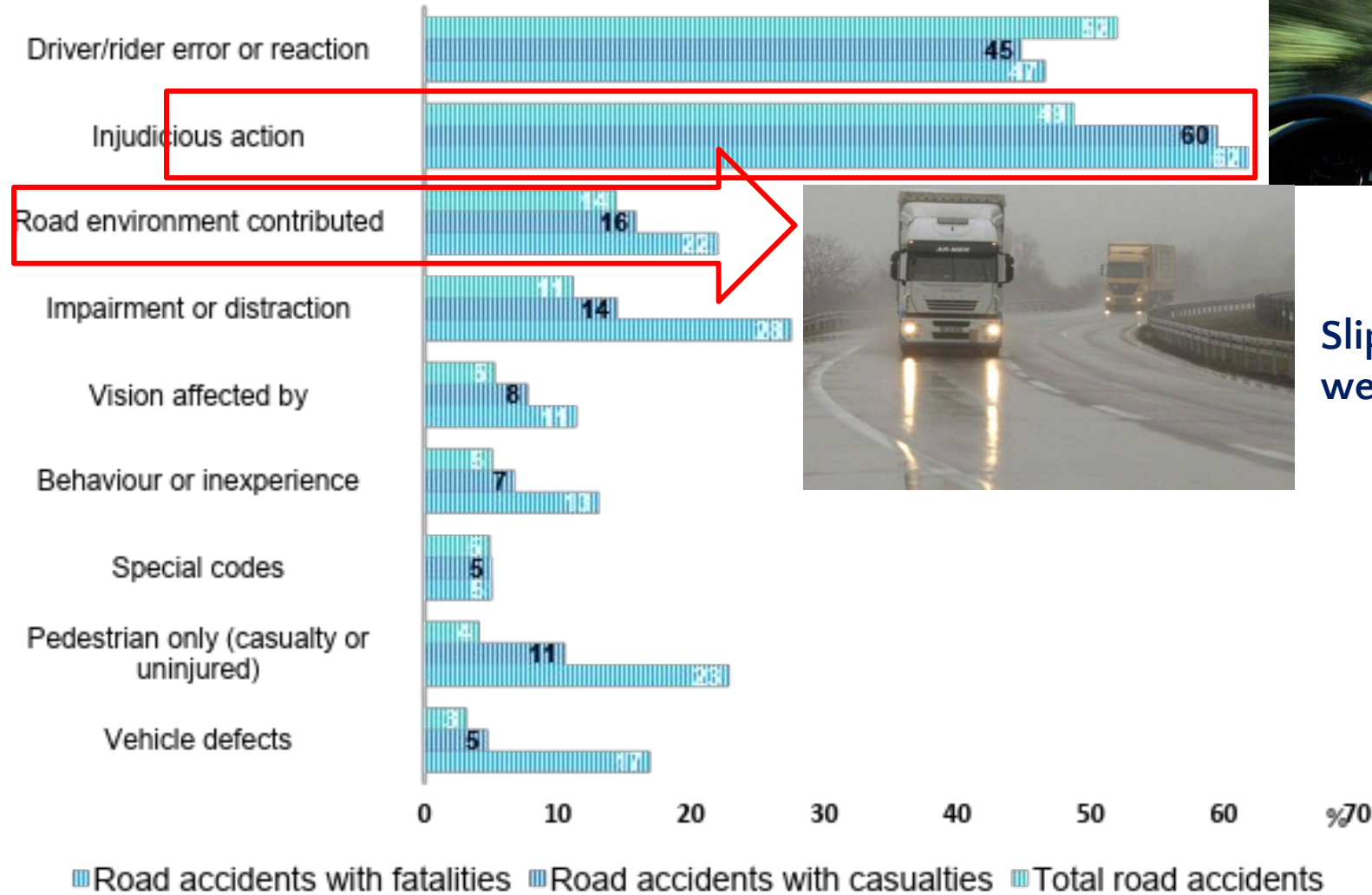
Analysis of contributory factors



Travelling too fast for traffic and road conditions



Slippery road due to weather condition

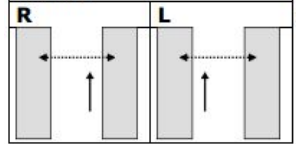
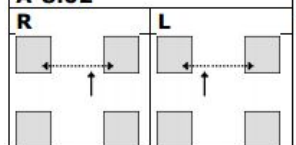
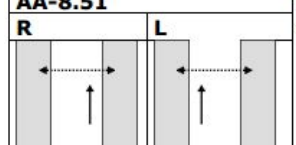
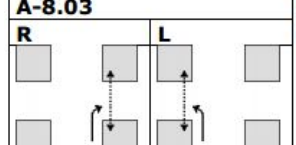
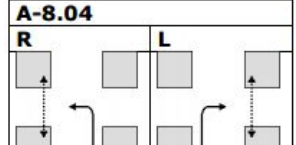
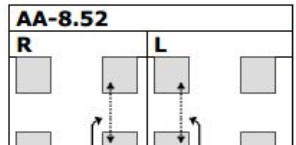


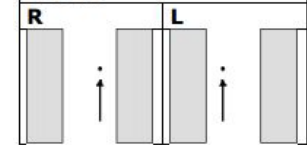
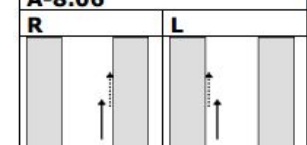
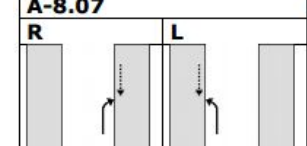
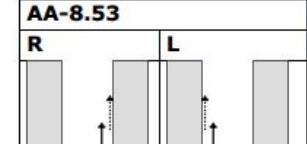
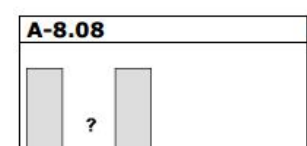
Road accident types

- **ACCIDENTS WITH PEDESTRIANS**
- **ACCIDENTS WITH PARKED VEHICLES**
- **SINGLE VEHICLE ACCIDENTS**
 - **AT LEAST TWO VEHICLES - NO TURNING**
 - **AT LEAST TWO VEHICLES - TURNING OR CROSSING**



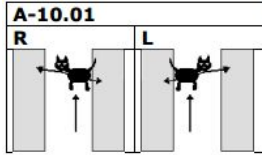
ACCIDENTS WITH PEDESTRIANS SKETCHES

<p>A-8.01</p> 	<p>Pedestrian crossing street - no turning of vehicle - outside a junction</p>
<p>A-8.02</p> 	<p>Pedestrian crossing street - no turning of vehicle - at a junction</p>
<p>AA-8.51</p> 	<p>Pedestrian crossing street - no turning of vehicle - not specified</p>
<p>A-8.03</p> 	<p>Pedestrians crossing - turning of vehicle turning right (left)</p>
<p>A-8.04</p> 	<p>Pedestrians crossing - turning of vehicle turning left (right)</p>
<p>AA-8.52</p> 	<p>Pedestrians crossing - turning of vehicle - not specified</p>

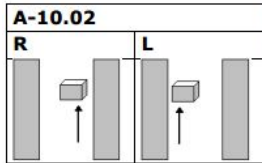
<p>A-8.05</p> 	<p>Pedestrian stationary in the road</p>
<p>A-8.06</p> 	<p>Pedestrian walking along the road</p>
<p>A-8.07</p> 	<p>Pedestrians on pavement or bicycle lane</p>
<p>AA-8.53</p> 	<p>Pedestrian walking along the road or stationary in the road</p>
<p>A-8.08</p> 	<p>Pedestrian others</p>



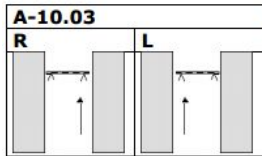
SINGLE VEHICLE ACCIDENTS SKETCHES



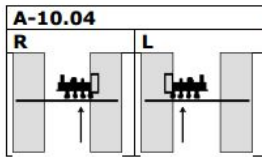
A-10.01 Single vehicle accidents with animals



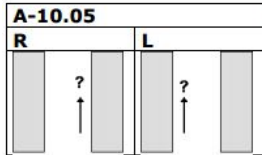
A-10.02 Single vehicle accidents with obstacles on or above the road



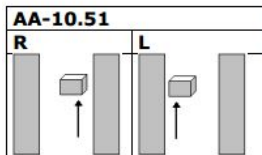
A-10.03 Single vehicle accidents with roadwork materials



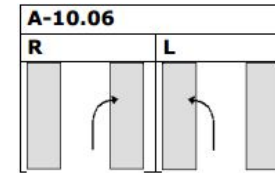
A-10.04 Accidents between train and vehicle



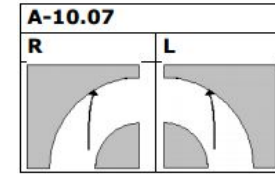
A-10.05 Single vehicle accidents with obstacles - others



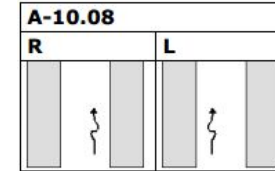
AA-10.51 Single vehicle accidents with obstacles on the road - not specified



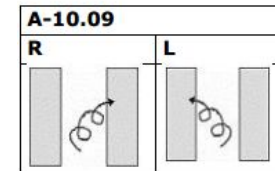
A-10.06 Single vehicle accident - Leaving straight road - either side of the road



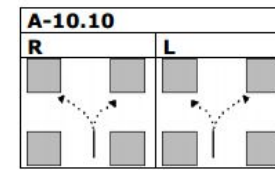
A-10.07 Single vehicle accidents in a bend - going either side of the road



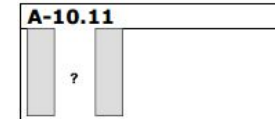
A-10.08 Single vehicle accidents on the road



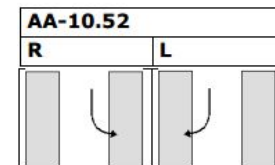
A-10.09 Single vehicle accidents including rollover



A-10.10 Single vehicle accidents in junctions or entrances

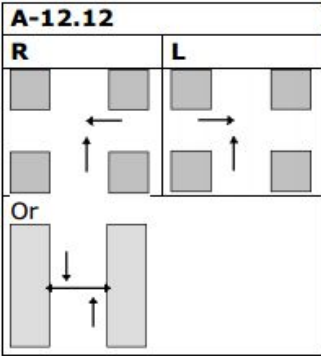


A-10.11 Single vehicle accidents without obstacles - others

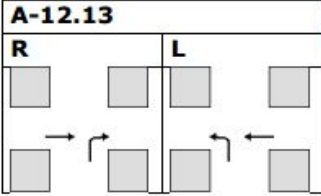


AA-10.52 Single vehicle accidents without obstacles on the road

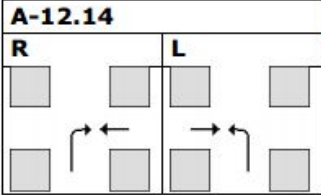
AT LEAST TWO VEHICLES - TURNING OR CROSSING SKETCHES



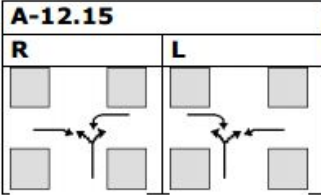
At least two vehicles - crossing (no turning) - different roads



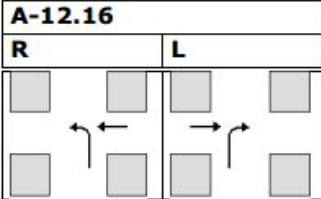
At least two vehicles - different roads - turning right (left) in front of vehicle from the left (right)



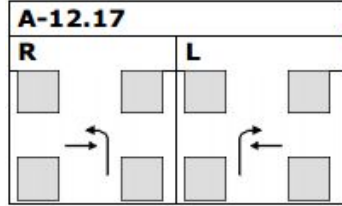
At least two vehicles - different roads - turning right (left) - head on collision



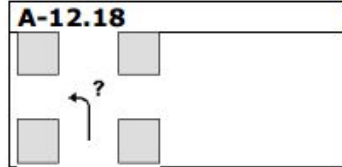
At least two vehicles - different roads - both vehicles turning



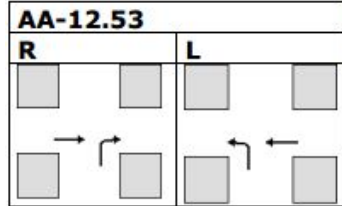
At least two vehicles - different roads - turning left (right) into traffic from the right (left) side



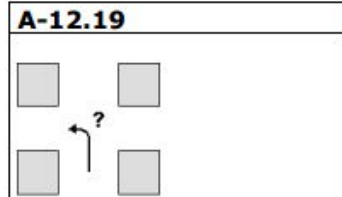
At least two vehicles - different roads - turning left (right) into traffic from the left (right) side



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

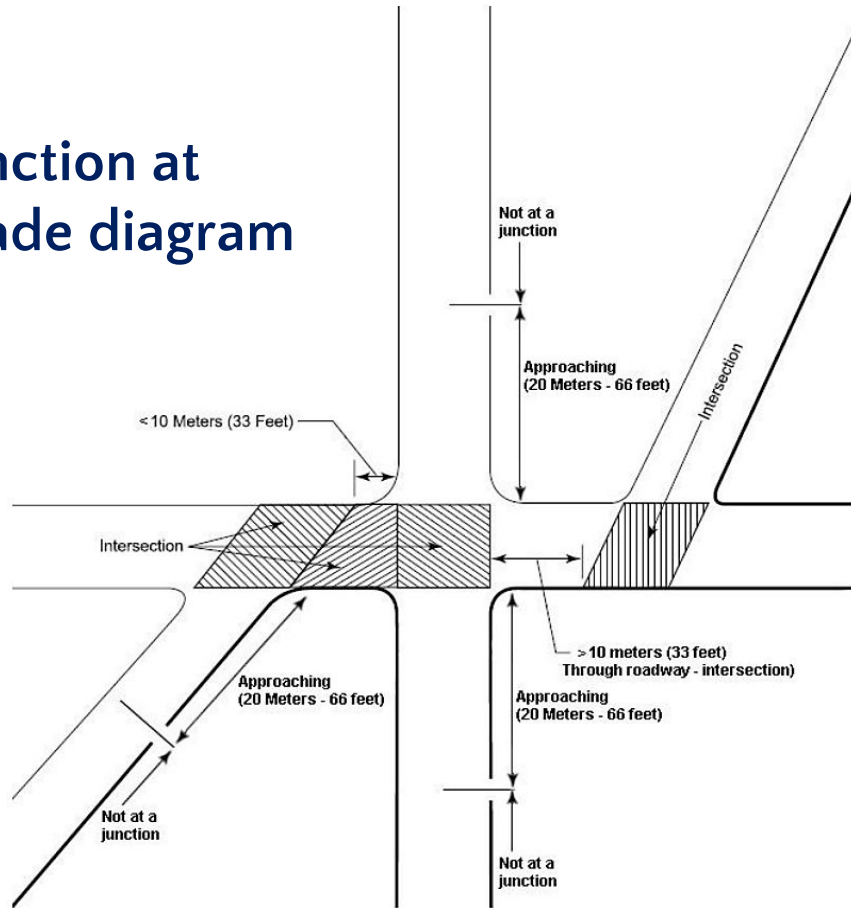


At least two vehicles - turning - different roads - not specified

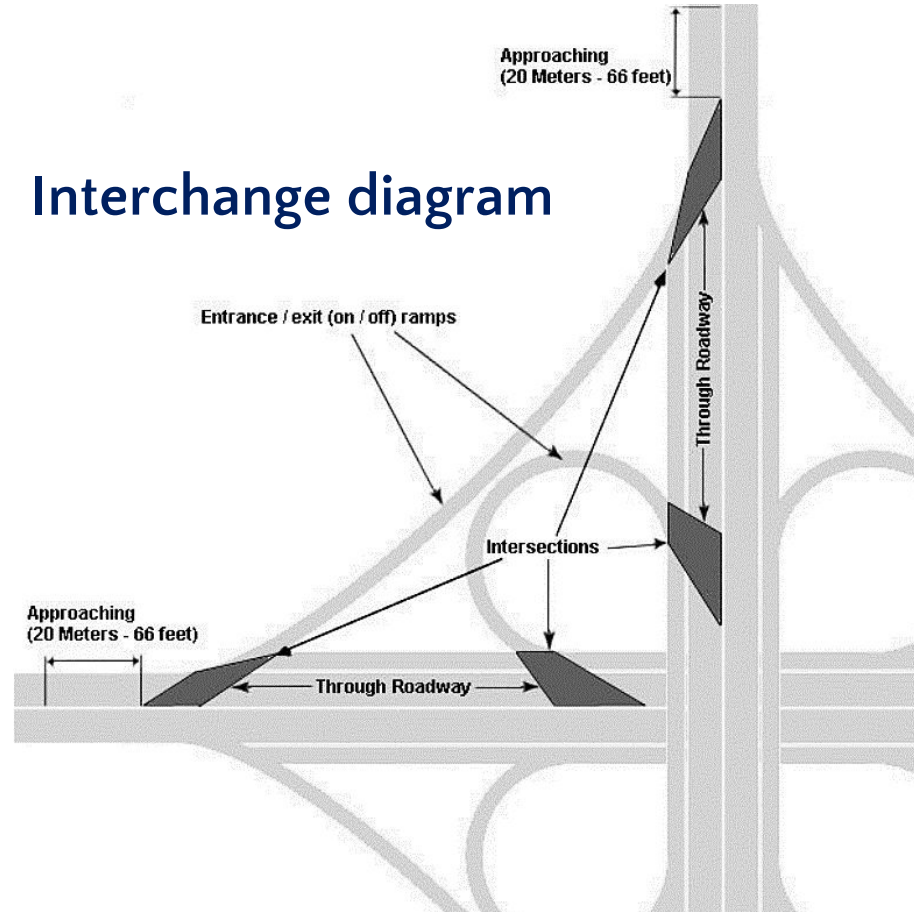


At least two vehicles - crossing or turning - others

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

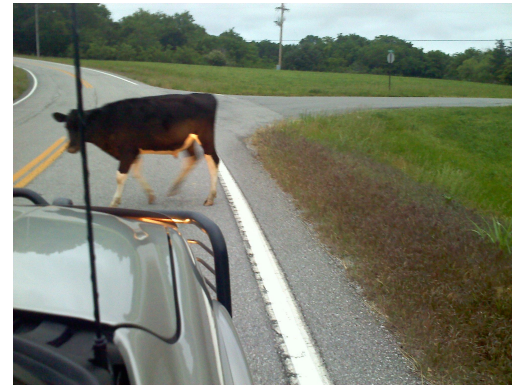
YES

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)



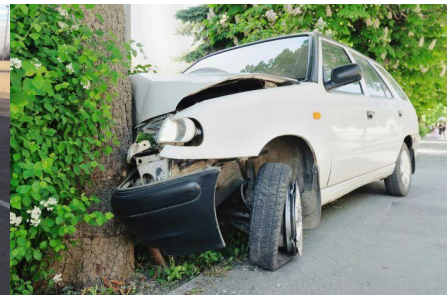
Importance of CADaS in practice

● 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



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

Dr. Dragoslav Kukić

Crash Database Specialist and Road Safety Specialist

E mail: kukicdragoslav@gmail.com



World Bank