

CADaS - A common road accident data framework in Europe

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4th IRTAD CONFERENCE

***Road safety data: collection and analysis
for target setting and monitoring performances and progress***



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SCOPE

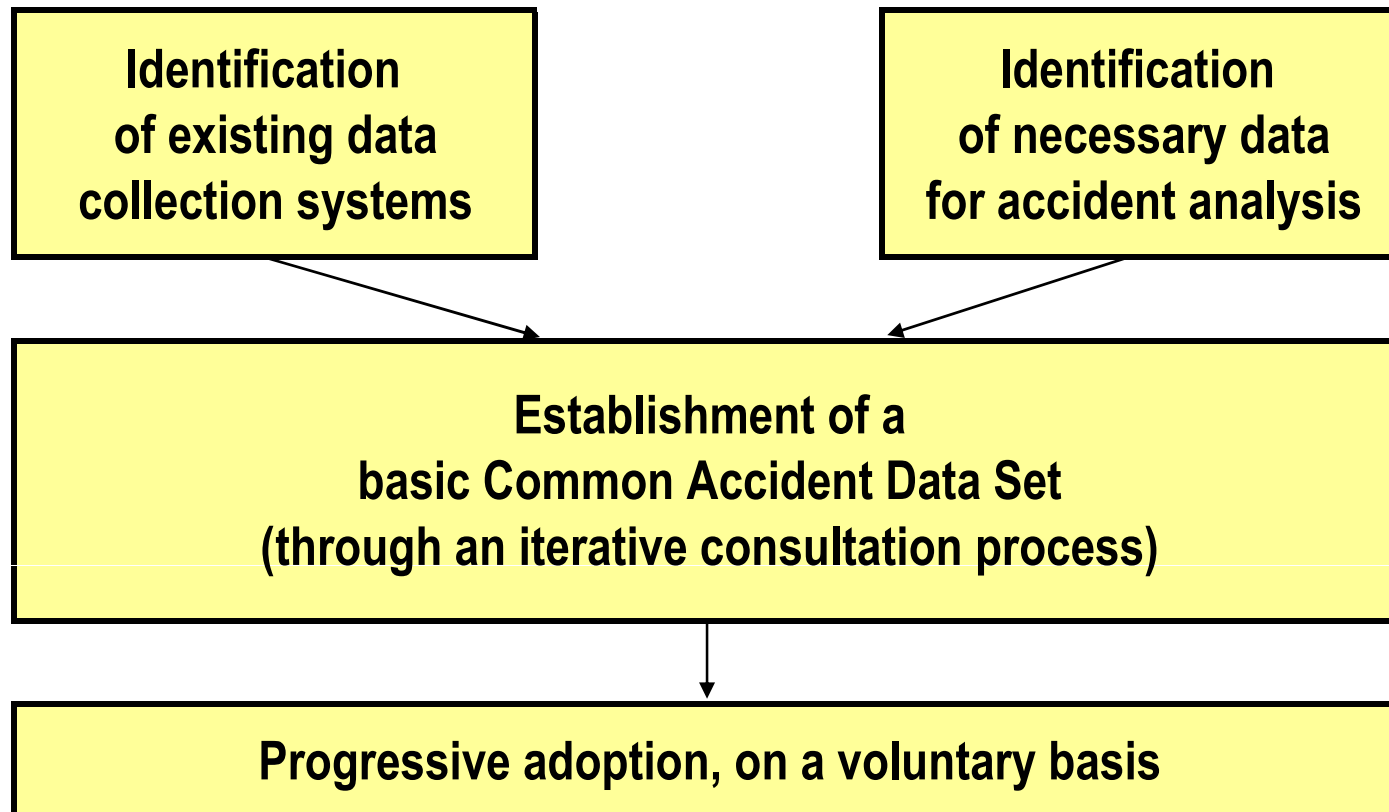
- The **Common Accident Data Set (CADaS)** allows for comparable road accident data to be available in Europe.
- The **CADaS** system will be implemented by the EU Member States:
 - on a voluntary basis
 - in pieces ("a la carte" system)
 - gradually

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.



A FOUR STEP METHODOLOGY



- SafetyNet partners: NTUA (EL), DRD (DK), TRL (UK), CDV (CZ), KfV (AT), KTI (HU), SWOV (NL), INTRAS (ES)
- CARE Experts group
- EC Road Safety Unit



FROM CAREPLUS OF TODAY TO CADaS OF TOMORROW

CAREPLUS

(data transformed at EU level)

National data are sent to the EC without any elaboration. The EC applies transformation rules in order to transform them into the CAREPLUS common definition values.

55 Variables and 255 Values

CADaS

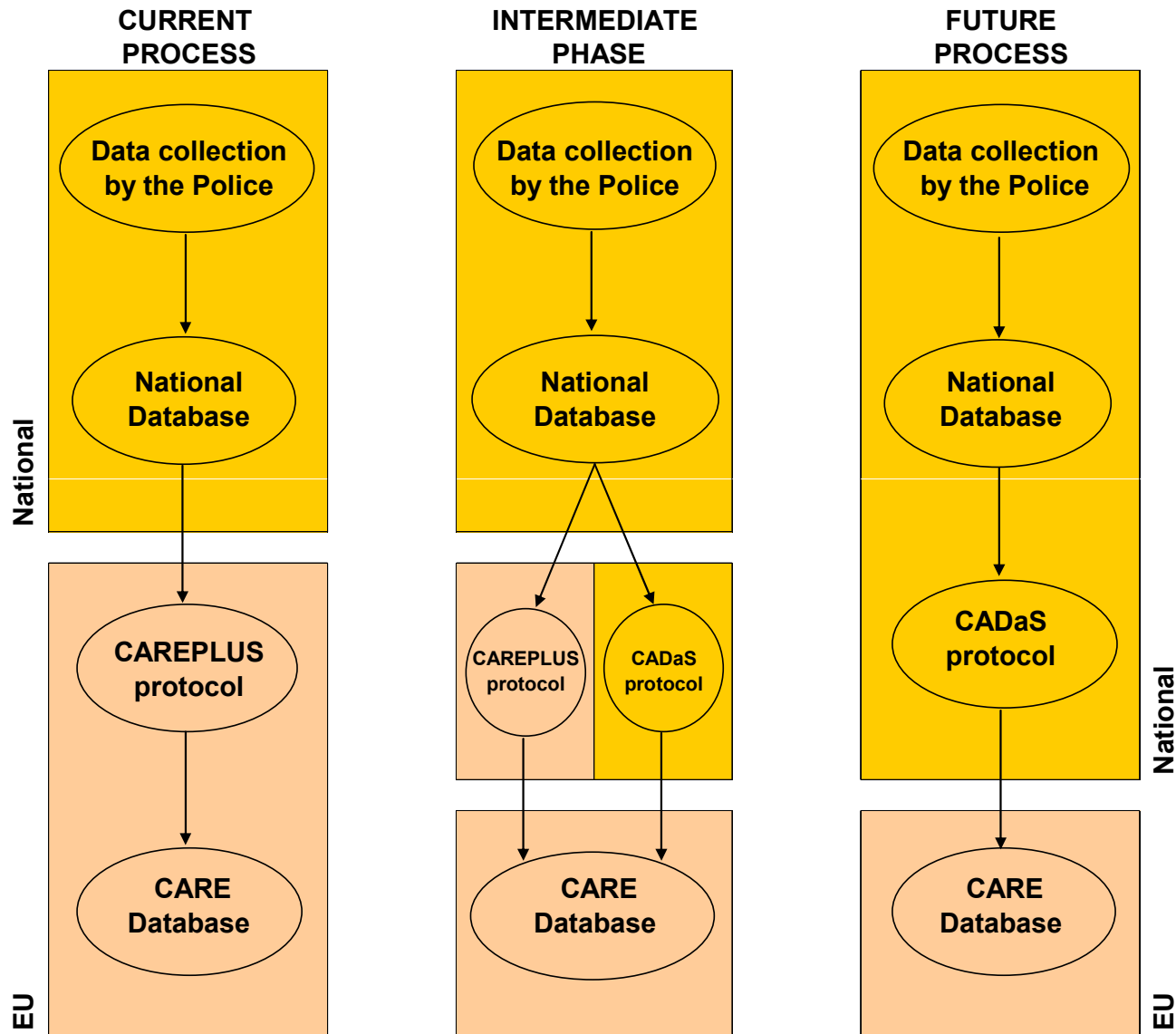
(data transformed at national level)

National data are further processed and transformed in accordance to the CADaS definitions and structure (record layout) in each country. Then, each country transmits the CADaS data to the EC.

73 Variables and 471 Values



CURRENT, INTERMEDIATE AND FUTURE PROCESSES



OPTIONAL ADJUSTMENTS OF THE NATIONAL SYSTEMS (1)

- EU countries continue using their national accident data collection systems. They collect data in the way they find it more suitable (manually, electronically, links with other databases, etc.).
- Whenever they wish they can implement adjustments in order to be able to transform data according to the CADaS protocol and provide to the EU more data compatible throughout Europe.
- Some variables might need to be collected under a different structure to meet local/regional/national needs. Countries continue using the particular variables and use appropriate transformations to transmit them to the EC.



OPTIONAL ADJUSTMENTS OF THE NATIONAL SYSTEMS (2)

- The EU countries can choose to adopt as many CADaS variables and values as they wish.
- The CADaS is structured in a simple way, without levels of hierarchy, constituting in fact the record layout of the data set to be transferred to the EU
- CADaS may also be considered as recommendation for national police road accident data collection reports.
- CADaS can be further enhanced (derived variables to be added) inside the CARE database allowing for a wide range of analysis reports.



SELECTION CRITERIA FOR CADaS VARIABLES AND VALUES (1)

1. **Variables and values must be useful** for road accident analysis, especially at EU level.
2. **The level of detail of the variables and values** corresponds to all data useful for macroscopic data analysis and not for detailed reconstruction of the scene of the accident, which is of local interest.
3. Each country should have the possibility to choose **alternative level of detail** of the various values.
4. **Variables and values must be comprehensive and concise.** Each variable must include description and scope, attribute values, their definitions and data format.



SELECTION CRITERIA FOR CADaS VARIABLES AND VALUES (2)

5. Data impossible or very difficult to be collected are not retained in the CADaS, independently of their value for road accident analysis; as such data might be of low quality.
6. The future perspective of using certain variables and values was taken into account, even though those data are not currently collected by most of the countries due to current technical difficulties (i.e. latitude and longitude etc.).
7. Existing variables and values of CAREPLUS are of first priority within CADaS.
8. CADaS variables and values refer to casualty road accidents; material damage-only accidents are not considered. Not injured participants can optionally be recorded.



VARIABLES 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,

U, for **Traffic Unit** related variables,

P, for **Person** related variables

Example: **A-2 ACCIDENT DATE**



THREE LEVEL STRUCTURE

Accident

| Accident | |
|--|--|
| A-1 ACCIDENT ID | |
| A-2 ACCIDENT DATE | |
| A-3 ACCIDENT TIME | |
| A-4 NUTS | |
| A-5 LAU | |
| A-6 WEATHER CONDITIONS | |
| A-7 LIGHT CONDITIONS | |
| A-8 ACCIDENTS WITH PEDESTRIANS | |
| A-9 ACCIDENTS WITH PARKED VEHICLES | |
| A-10 SINGLE VEHICLE ACCIDENTS | |
| A-11 AT LEAST TWO VEHICLES - NO TURNING | |
| A-12 AT LEAST TWO VEHICLES - TURNING OR CROSSING | |

Road

| Road | |
|---------------------------------|------------------------------|
| A-1 ACCIDENT ID | R-18 ROAD SURFACE CONDITIONS |
| R-1 LATITUDE | R-19 ROAD OBSTACLES |
| R-2 LONGITUDE | R-20 CARRIAGEWAY TYPE |
| R-3 E-ROAD | R-21 SINGLE CARRIAGEWAY TYPE |
| R-4 E-ROAD KILOMETRE | R-22 NUMBER OF LANES |
| R-5 FUNC. CLASS - 1st ROAD | R-23 TRAFFIC LANE WIDTH |
| R-6 FUNC. CLASS - 2nd ROAD | R-24 EMERGENCY LANE |
| R-7 AADT - 1st ROAD | R-25 ROAD MARKINGS |
| R-8 AADT - 2nd ROAD | R-26 WORK ZONE RELATED |
| R-9 SPEED LIMIT - 1st ROAD | R-27 REL. TO THE WORK ZONE |
| R-10 SPEED LIMIT - 2nd ROAD | R-28 TYPE OF WORKS |
| R-11 MOTORWAY | R-29 ROAD CURVE |
| R-12 URBAN AREA | R-30 ROAD CURVATURE |
| R-13 ACCIDENT AT JUNCTION | R-31 ROAD CURV. LENGTH |
| R-14 AT GRADE JUNCTION TYPE | R-32 ROAD CURV. SUPERELEV. |
| R-15 REL. TO THE AT GRADE JUNC. | R-33 ROAD SEGMENT GRADE |
| R-16 REL. TO THE INTERCHANGE | R-34 GRADE |
| R-17 JUNCTION CONTROL | |

Traffic Unit

| Vehicle 1 | |
|------------------------------|----------------------------|
| A-1 ACCIDENT ID | V-9 MODEL |
| V-1 VEHICLE ID | V-10 REGISTRATION YEAR |
| V-2 VEHICLE TYPE | V-11 VEHICLE MANOEUVRE |
| V-3 VEHICLE SPECIAL FUNCTION | V-12 FIRST POINT OF IMPACT |
| V-4 TRAILER | V-13 FIRST OBJECT HIT IN |
| V-5 ENGINE POWER | V-14 FIRST OBJECT HIT OFF |
| V-6 ACTIVE SAFETY EQUIPMENT | V-15 INSURANCE |
| V-7 VEHICLE DRIVE | V-16 HIT & RUN |
| V-8 MAKE | V-17 REGISTRATION COUNTRY |

| Vehicle 2 | |
|-----------|-----|
| ... | ... |

Person

| Person 1 | |
|---|--|
| A-1 ACCIDENT ID | |
| V-1 VEHICLE ID | |
| P-1 LINKED VEHICLE | |
| P-2 PERSON ID | |
| P-3 DATE OF BIRTH | |
| P-4 GENDER | |
| P-5 NATIONALITY | |
| P-6 INJURY TYPE | |
| P-7 ROAD USER TYPE | |
| P-8 ALCOTEST | |
| P-9 ALCOTEST SAMPLE TYPE | |
| P-10 ALCOTEST RESULT | |
| P-11 ALCOHOL LEVEL | |
| P-12 DRUG TEST | |
| P-13 DRUG TEST RESULT | |
| P-14 DRIV. LICENSE ISSUE DATE | |
| P-15 DRIVING LICENSE VALIDITY | |
| P-16 SAFETY EQUIPMENT | |
| P-17 POSITION IN/ON VEHICLE | |
| P-18 PARTIC. DISTR. BY DEVICE | |
| P-19 PSYCOPHYS./PHYS. IMPAIRMENT OR CONDITION | |
| P-20 TRIP/JOURNEY PURPOSE | |

| Person 2 | |
|----------|-----|
| ... | ... |

| Person 3 | |
|----------|-----|
| ... | ... |



VARIABLE COMPONENTS

Variable Label:

- Section identifier (A, R, U 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



VALUE COMPONENTS

Value Labels:

Each value is further identified by the code of the variable, followed by a number which corresponds to each value and its name.

Value definitions:

The definition of each value is given, indicating also any particularities and any relevant assumptions regarding its collection.

Data format, concerning:

- Possibility to attribute one or more values to a variable
- Format of the value (nr. of digits, decimal places, etc).



DATA FORMAT

The format of each variable included in the CADaS can vary, depending on the data collection needs

Various data formats were considered:

- Single numbers, corresponding to specific values (e.g. "1" corresponding to "driver"),
- Numbers with a straightforward meaning (date, age, engine power etc),
- Multiple numbers (each corresponding to a specific value), adopted in cases where several choices can be made,
- Codes (using a relevant value list, and the respective codes), e.g. Eurostat NUTS or E-road codes.



VARIABLE EXAMPLE

A-6 WEATHER CONDITIONS (H)

Variable definition and scope

This variable defines the atmospheric conditions at the accident location at the time of the accident and allows for the identification of the impact of weather conditions to the road safety.

Values

A-6.01 Dry / Clear

A-6.02 Rain

A-6.03 Snow

A-6.04 Fog, Mist, Smoke

A-6.05 Sleet, Hail

A-6.06 Severe winds

A-6.07 Other

A-6.99 Unknown

Value definitions

A-6.01: Dry / Clear

No hindrance from weather. Includes clear and cloudy sky.

A-6.02: Rain

Heavy or light rain at the time of the accident.

A-6.03: Snow

Snowing at the time of the accident.

A-6.04: Fog, Mist, Smoke

Existence of fog or mist or smoke at the time of the accident.

A-6.05: Sleet, Hail

Existence of sleet or hail at the time of the accident.

A-6.06: Severe winds

Presence of winds deemed to have an adverse affect on driving conditions.

A-6.07: Other

Other atmospheric conditions that affected the drivers or the road environment are not included in the list of the previous values.

A-6.99: Unknown

Atmospheric conditions not recorded or unknown.

Data format

Up to two values can be selected. A four digit number is filled in where the first two digits refer to the first choice and the rest refer to the second (if any). If only one value is to be selected the first two digits are filled in and the rest two digits are filled in with zeros.



VALUE CATEGORIES

- For several variables, two main distinct types of values are defined (according to the detail in which these data can be obtained):
 1. **Detailed:** information at the highest level of detail.
 2. **Alternative:** information of a more aggregate level of detail, when more detailed values are not available.
- Alternative values **do not differ** from detailed values apart from their level of detail. These values are complementary and can be used when more detailed data are not available.

Especially for alternative values, the A identifier is used
(e.g. AA, RA, UA, PA)



EXAMPLE OF ALTERNATIVE VALUES

Variable: NATIONALITY

Values:

Detailed:

P-5.XXX Nationality code (one code corresponding to each country)

Alternative:

P-5.951 National

P-5.952 Foreigner, within the EU

P-5.953 Foreigner, outside the EU

P-5.954 Foreigner, not specified

P-5.999 Unknown

The detailed value indicates the person nationality at a disaggregate level (country code).

If the person nationality is not available at this level of detail, one of the alternative (aggregate) values can be selected.



CLASSIFICATION OF THE VARIABLES

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 SafetyNet partners:

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


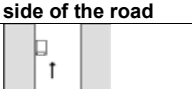
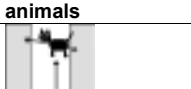
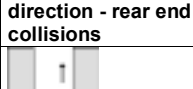
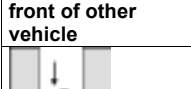
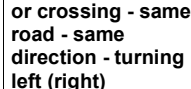
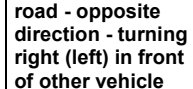
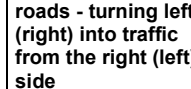
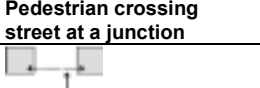
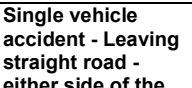
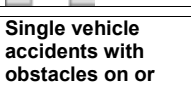
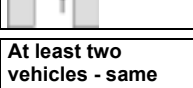
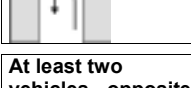
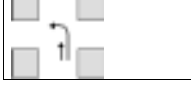

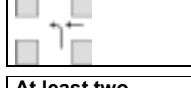



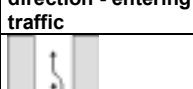
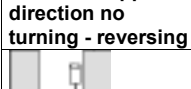
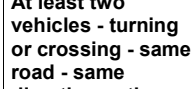
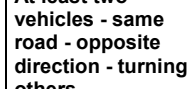
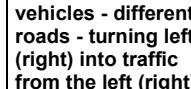

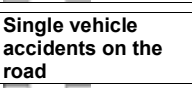
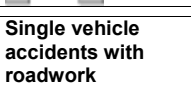
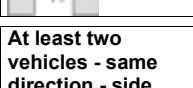
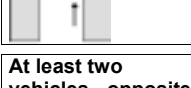
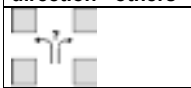


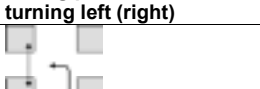
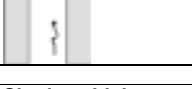


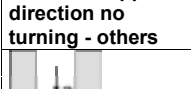
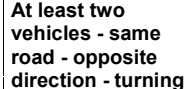
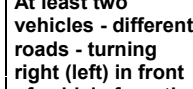
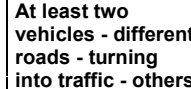
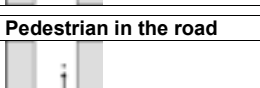
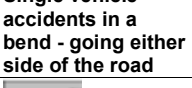
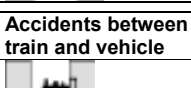
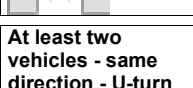
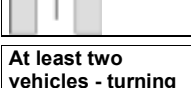
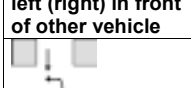
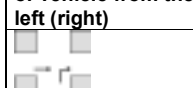

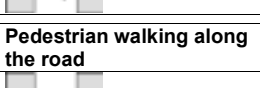
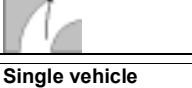
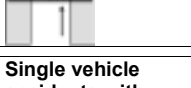
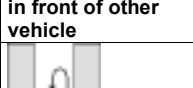
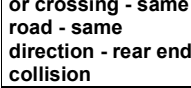
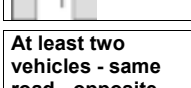
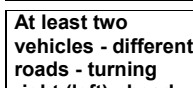


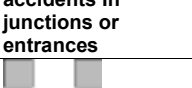
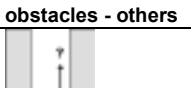
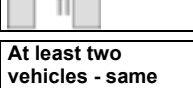
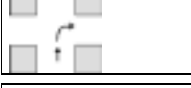
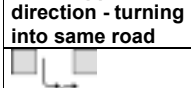
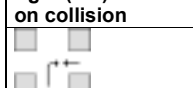

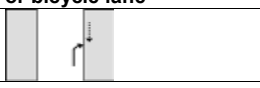
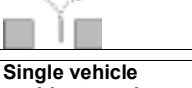
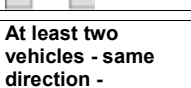
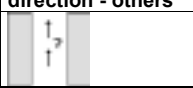
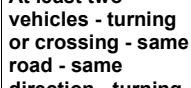
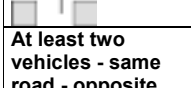
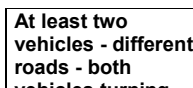



SUMMARY OF CADaS VARIABLES AND VAULES

| Variable category | Code | Number of Variables | | | Number of Values | | |
|-------------------|----------|---------------------|----------------------|-----------|------------------|------------------------|------------|
| | | High (H) importance | Lower (L) importance | Total | Detailed values | Alternative values (A) | Total |
| Accident | A | 7 | 5 | 12 | 86 | 13 | 98 |
| Road | R | 11 | 15 | 26 | 106 | 13 | 119 |
| Traffic Unit | U | 7 | 10 | 17 | 137 | 15 | 152 |
| Person | P | 11 | 7 | 18 | 91 | 10 | 102 |
| Total | | 36 | 37 | 73 | 420 | 51 | 471 |



ACCIDENT TYPE SKETCHES

| | | | | | | | |
|--|--|---|---|--|--|---|---|
| <p>Pedestrian crossing street outside a junction</p>  | <p>Hitting parked vehicles left (right) side of the road</p>  | <p>Single vehicle accidents with animals</p>  | <p>At least two vehicles - same direction - rear end collisions</p>  | <p>At least two vehicles - U-turn in front of other vehicle</p>  | <p>At least two vehicles - turning or crossing - same road - same direction - turning left (right)</p>  | <p>At least two vehicles - same road - opposite direction - turning right (left) in front of other vehicle</p>  | <p>At least two vehicles - different roads - turning left (right) into traffic from the right (left) side</p>  |
| <p>Pedestrian crossing street at a junction</p>  | <p>Single vehicle accident - Leaving straight road - either side of the road</p>  | <p>Single vehicle accidents with obstacles on or above the road</p>  | <p>At least two vehicles - same direction - entering traffic</p>  | <p>At least two vehicles - opposite direction no turning - reversing</p>  | <p>At least two vehicles - turning or crossing - same road - same direction - others</p>  | <p>At least two vehicles - same road - opposite direction - turning right (left) in front of other vehicle</p>  | <p>At least two vehicles - different roads - turning left (right) into traffic from the left (right) side</p>  |
| <p>Hitting pedestrian - turning right (left)</p>  | <p>Single vehicle accidents on the road</p>  | <p>Single vehicle accidents with roadwork materials</p>  | <p>At least two vehicles - same direction - side collision</p>  | <p>At least two vehicles - opposite direction no turning - others</p>  | <p>At least two vehicles - turning or crossing - same road - opposite direction - others</p>  | <p>At least two vehicles - different roads - turning right (left) in front of vehicle from the left (right)</p>  | <p>At least two vehicles - different roads - turning left (right) into traffic from the left (right) side</p>  |
| <p>Hitting pedestrian - turning left (right)</p>  | <p>Single vehicle accidents in a bend - going either side of the road</p>  | <p>Accidents between train and vehicle</p>  | <p>At least two vehicles - same direction - U-turn in front of other vehicle</p>  | <p>At least two vehicles - turning or crossing - same road - same direction - rear end collision</p>  | <p>At least two vehicles - same road - opposite direction - turning left (right) in front of other vehicle</p>  | <p>At least two vehicles - different roads - turning right (left) in front of vehicle from the left (right)</p>  | <p>At least two vehicles - different roads - turning into traffic - others</p>  |
| <p>Pedestrian in the road</p>  | <p>Single vehicle accidents in junctions or entrances</p>  | <p>Single vehicle accidents with obstacles - others</p>  | <p>At least two vehicles - same direction - others</p>  | <p>At least two vehicles - turning or crossing - same road - same direction - rear end collision</p>  | <p>At least two vehicles - same road - opposite direction - turning into same road</p>  | <p>At least two vehicles - different roads - turning right (left) - head on collision</p>  | <p>At least two vehicles - different roads - turning left (right) - head on collision</p>  |
| <p>Pedestrian walking along the road</p>  | <p>Single vehicle accidents in junctions or entrances</p>  | <p>Single vehicle accidents with obstacles - others</p>  | <p>At least two vehicles - same direction - others</p>  | <p>At least two vehicles - turning or crossing - same road - same direction - rear end collision</p>  | <p>At least two vehicles - same road - opposite direction - turning into same road</p>  | <p>At least two vehicles - different roads - turning right (left) - head on collision</p>  | <p>At least two vehicles - different roads - turning left (right) - head on collision</p>  |
| <p>Pedestrians on pavement or bicycle lane</p>  | <p>Single vehicle accidents in junctions or entrances</p>  | <p>Single vehicle accidents with obstacles - others</p>  | <p>At least two vehicles - same direction - others</p>  | <p>At least two vehicles - turning or crossing - same road - same direction - rear end collision</p>  | <p>At least two vehicles - same road - opposite direction - turning into same road</p>  | <p>At least two vehicles - different roads - turning right (left) - head on collision</p>  | <p>At least two vehicles - different roads - turning left (right) - head on collision</p>  |
| <p>Hitting parked vehicles right (left) side of the road</p>  | <p>Single vehicle accidents - others</p>  | <p>At least two vehicles - same direction - overtaking</p>  | <p>At least two vehicles - head on collision in general</p>  | <p>At least two vehicles - turning or crossing - same road - same direction - turning right (left)</p>  | <p>At least two vehicles - same road - opposite direction - turning into opposite roads</p>  | <p>At least two vehicles - different roads - turning right (left) - head on collision</p>  | <p>At least two vehicles - different roads - turning left (right) - head on collision</p>  |
| <p>Hitting parked vehicles right (left) side of the road</p>  | <p>Single vehicle accidents - others</p>  | <p>At least two vehicles - same direction - overtaking</p>  | <p>At least two vehicles - head on collision in general</p>  | <p>At least two vehicles - turning or crossing - same road - same direction - turning right (left)</p>  | <p>At least two vehicles - same road - opposite direction - turning into opposite roads</p>  | <p>At least two vehicles - different roads - turning right (left) - head on collision</p>  | <p>At least two vehicles - different roads - turning left (right) - head on collision</p>  |

ACCIDENT RELATED VARIABLES (1)

| A-1 ACCIDENT ID | | H | A-4 NUTS | | H | A-6 WEATHER CONDITIONS | | H | A-7 LIGHT CONDITIONS | | H |
|---|---------|---|---------------|--------|----|--|----|---|------------------------------|----|----|
| Country code | xx | | NUTS 3 | code | | Dry/Clear | 01 | | Daylight | 01 | |
| Year | xxxx | | NUTS 2 (A) | code | | Rain | 02 | | Twilight | 02 | |
| Accident ID | xxxxxx | | NUTS 1 (A) | code | | Snow | 03 | | Darkness street lights lit | 03 | |
| | | | Unknown | 99999 | | Fog, Mist, Smoke | 04 | | Darkness street lights unlit | 04 | |
| | | | | | | Sleet, Hail | 05 | | Darkness no street lights | 05 | |
| A-2 ACCIDENT DATE | | H | A-5 LAU | | H | Severe Winds | 06 | | Unknown | 99 | |
| Date | xxxxxxx | | LAU 2 / LAU 1 | code | | Other | 07 | | | | |
| | | | Unknown | 99...9 | | Unknown | 99 | | | | |
| A-3 ACCIDENT TIME | | H | | | | | | | | | |
| Time | hhmm | | | | | | | | | | |
| Unknown | 9999 | | | | | | | | | | |
| A-8 ACCIDENTS WITH PEDESTRIANS | | | | | L | A-9 ACCIDENTS WITH PARKED VEHICLES | | | | | L |
| Not applicable | | | | | 00 | Not applicable | | | | | 00 |
| Pedestrian crossing street - no turning of vehicle - outside a junction | | | | | 01 | Hitting parked vehicles right (left) side of the road | | | | | 01 |
| Pedestrian crossing street - no turning of vehicle - at a junction | | | | | 02 | Hitting parked vehicles left (right) side of the road | | | | | 02 |
| Pedestrian crossing street - no turning of vehicle - not specified (A) | | | | | 51 | Hitting parked vehicles-side of the road-not specified (A) | | | | | 51 |
| Pedestrian crossing - turning of vehicle - turning right (left) | | | | | 03 | Accidents with parked vehicles - opening doors | | | | | 03 |
| Pedestrian crossing - turning of vehicle - turning left (right) | | | | | 04 | Other accidents with parked vehicles | | | | | 04 |
| Pedestrian crossing - turning of vehicle - not specified (A) | | | | | 52 | Accidents with parked vehicles - unknown | | | | | 99 |
| Pedestrian hit by reversing vehicle | | | | | 05 | | | | | | |
| Pedestrian stationery in the road | | | | | 06 | | | | | | |
| Pedestrian walking along the road | | | | | 07 | | | | | | |
| Pedestrians on pavement or bicycle lane | | | | | 08 | | | | | | |
| Pedestrian walking along the road or stationary in the road (A) | | | | | 53 | | | | | | |
| Pedestrian others | | | | | 09 | | | | | | |
| Pedestrian accident - unknown | | | | | 99 | | | | | | |



ACCIDENT RELATED VARIABLES (2)

| A-10 SINGLE VEHICLE ACCIDENTS | | L | A-11 AT LEAST TWO VEHICLES - NO TURNING | | L |
|---|-----|----|---|-----|----|
| Not applicable | | 00 | Not applicable | | 00 |
| With animals | | 01 | Same direction - overtaking | | 01 |
| With obstacles on or above the road | | 02 | Same direction - rear end collisions | | 02 |
| With roadwork materials | | 03 | Same direction - entering traffic | | 03 |
| Accidents between train/tram and vehicle | | 04 | Same direction - side collision | | 04 |
| With obstacles - others | | 05 | Same direction - others | | 05 |
| With obstacles on the road - not specified | (A) | 51 | Same direction no turning - not specified | (A) | 51 |
| Leaving straight road - either side of the road | | 06 | Head on collision in general | | 06 |
| In a bend - going either side of the road | | 07 | Opposite direction no turning - reversing | | 07 |
| On the road | | 08 | Opposite direction no turning - others | | 08 |
| Including rollover | | 09 | Opposite direction no turning - not specified | (A) | 52 |
| In junctions or entrances | | 10 | Others no turning | | 09 |
| Without obstacles - others | | 11 | At least two vehicles - no turning - unknown | | 99 |
| Without obstacles on the road | (A) | 52 | | | |
| Single vehicle accidents - unknown | | 99 | | | |

| A-12 AT LEAST TWO VEHICLES - TURNING OR CROSSING | | L |
|--|-----|----|
| Not applicable | | 00 |
| Same road - same direction - rear end collision | | 01 |
| Same road - same direction - U-turn in front of other vehicle | | 02 |
| Same road - same direction - turning right (left) | | 03 |
| Same road - same direction - turning left (right) | | 04 |
| Same road - same direction - others | | 05 |
| Same road - same direction - not specified | (A) | 51 |
| Same road - opposite direction - turning left (right) in front of other vehicle | | 06 |
| Same road - opposite direction - U-turn in front of other vehicle | | 07 |
| Same road - opposite direction - turning into same road | | 08 |
| Same road - opposite direction - turning into opposite roads | | 09 |
| Same road - opposite direction - turning right (left) in front of other vehicle | | 10 |
| Same road - opposite direction - turning others | | 11 |
| Same road - opposite direction - not specified | (A) | 52 |
| Crossing (no turning) - different roads | | 12 |
| Different roads - turning right (left) in front of vehicle from the left (right) | | 13 |
| Different roads - turning right (left) - head on collision | | 14 |
| Different roads - both vehicles turning | | 15 |
| Different roads - turning left (right) into traffic from the right (left) side | | 16 |
| Different roads - turning left (right) into traffic from the left (right) side | | 17 |
| Different roads - turning into traffic - others | | 18 |
| Turning - different roads - not specified | (A) | 53 |
| Crossing or turning - others | | 19 |
| At least two vehicles - turning or crossing - unknown | | 99 |



ROAD RELATED VARIABLES (1)

| A-1 ACCIDENT ID | | H | R-1 LATITUDE | | L | R-2 LONGITUDE | | L | R-3 E-ROAD | | L | R-4 E-ROAD | | L |
|-----------------|--------|---|--------------|-------------|---|---------------|-------------|---|------------|----------------|---|------------------|------|---|
| Country code | xx | | Latitude | +/-xxx.xxxx | | Longitude | +/-xxx.xxxx | | n/a | 0000/0000/0000 | | KILOMETRE | | |
| Year | xxxx | | Unknown | 9999999 | | Unknown | 9999999 | | Code(s) | xxxx/xxxx/xxxx | | n/a | 0000 | |
| Accident ID | xxxxxx | | | | | | | | Unknown | 9999/9999/9999 | | Kilometre | xxxx | |
| | | | | | | | | | | | | Unknown | 9999 | |

| R-5 ROAD FUNCTIONAL CLASS - FIRST ROAD | | H | R-6 ROAD FUNCTIONAL CLASS - SECOND ROAD | | H |
|--|--|----|---|--|----|
| Principal arterial | | 01 | Not applicable | | 00 |
| Secondary arterial | | 02 | Principal arterial | | 01 |
| Collector | | 03 | Secondary arterial | | 02 |
| Local | | 04 | Collector | | 03 |
| Other | | 05 | Local | | 04 |
| Unknown | | 99 | Other | | 05 |
| | | | Unknown | | 99 |

| R-7 AVERAGE ANNUAL DAILY TRAFFIC - FIRST ROAD | | L | R-8 AVERAGE ANNUAL DAILY TRAFFIC - SECOND ROAD | | L |
|---|--|--------|--|--|--------|
| A.A.D.T. | | xxxxxx | Not applicable | | 000000 |
| Unknown | | 999999 | A.A.D.T. | | xxxxxx |
| | | | Unknown | | 999999 |

| R-9 SPEED LIMIT - FIRST ROAD | | H | R-10 SPEED LIMIT - SECOND ROAD | | H | R-11 MOTORWAY | | H |
|------------------------------|-----|-----|--------------------------------|-----|-----|------------------------|--|----|
| Speed limit | | xxx | Not applicable | | 000 | Yes | | 01 |
| No speed limit | | 001 | Speed limit | | xxx | No | | 02 |
| Unknown | | 999 | No speed limit | | 001 | Unknown | | 99 |
| <30 km/h | (A) | 501 | Unknown | | 999 | | | |
| 30-50 km/h | (A) | 502 | <30 km/h | (A) | 501 | R-12 URBAN AREA | | |
| 51-80 km/h | (A) | 503 | 30-50 km/h | (A) | 502 | Inside | | 01 |
| 81-100 km/h | (A) | 504 | 51-80 km/h | (A) | 503 | Outside | | 02 |
| 101 - 120 km/h | (A) | 505 | 81-100 km/h | (A) | 504 | Unknown | | 99 |
| >120 km/h | (A) | 506 | 101 - 120km/h | (A) | 505 | | | |
| | | | >120 km/h | (A) | 506 | | | |



ROAD RELATED VARIABLES (2)

| R-13 JUNCTION | | H | R-14 REL. TO JUNCTION-INTERCHANGE | | L | R-15 JUNCTION CONTROL | | L |
|------------------------------------|--|----|-----------------------------------|--|----|------------------------------|--|----|
| Not at junction | | 00 | Not applicable | | 00 | Not applicable | | 00 |
| At grade - crossroad | | 01 | Approaching (20m) | | 01 | Authorised person | | 01 |
| At grade - roundabout | | 02 | Acceleration / deceleration lanes | | 02 | Give way/stop signs-markings | | 02 |
| At grade - T or staggered junction | | 03 | Through roadway | | 03 | Automatic traffic signals | | 03 |
| At grade - multiple junction | | 04 | Entrance - exit ramps | | 04 | Uncontrolled | | 04 |
| Not at grade (interchange) | | 05 | Crossover related | | 05 | Unknown | | 99 |
| Other | | 06 | Intersection | | 06 | | | |
| Unknown | | 99 | Unknown | | 99 | | | |

| R-16 SURFACE CONDITIONS | | H | R-17 OBSTACLES | | L | R-19 NUMBER OF LANES | | H |
|-------------------------|--|----|----------------|--|----|---------------------------------|--|----|
| Dry | | 01 | Yes | | 01 | Nr of lanes (1 or 2 directions) | | xx |
| Snow, frost, ice, slush | | 02 | No | | 02 | Nr of lanes (total) (A) | | xx |
| Slippery | | 03 | Unknown | | 99 | Unknown | | 99 |
| Wet,damp | | 04 | | | | | | |
| Flood | | 05 | | | | | | |
| Other | | 06 | | | | | | |
| Unknown | | 99 | | | | | | |

| R-18 CARRIAGEWAY TYPE | | H | R-20 EMERGENCY LANE | | L |
|-------------------------------------|--|----|---------------------|--|-----|
| Single carriageway - one way street | | 01 | Yes | | 01 |
| Single carriageway - two way street | | 02 | No | | 02 |
| Dual carriageway | | 03 | Unknown | | 100 |
| Unknown | | 99 | | | |

| R-21 MARKINGS | | L | R-22 TUNNEL | | L | R-23 BRIDGE | | L |
|--|--|----|-------------|--|----|-------------|--|----|
| None or faded / deleted | | 01 | Yes | | 01 | Yes | | 01 |
| Only separating travel directions | | 02 | No | | 02 | No | | 02 |
| Separating travel directions and lanes | | 03 | Unknown | | 99 | Unknown | | 99 |
| Only separating lanes | | 04 | | | | | | |
| Other | | 05 | | | | | | |
| Unknown | | 99 | | | | | | |

| R-24 WORK ZONE RELATED | | H | R-25 ROAD CURVE | | L | R-26 ROAD SEGMENT GRADE | | L |
|------------------------|--|----|-----------------|--|----|-------------------------|--|----|
| Yes | | 01 | Yes | | 01 | Yes | | 01 |
| No | | 02 | No | | 02 | No | | 02 |
| Unknown | | 99 | Unknown | | 99 | Unknown | | 99 |



TRAFFIC UNIT RELATED VARIABLES (1)

| A-1 ACCIDENT ID | | H | U-2 TRAFFIC UNIT TYPE | | H | U-3 VEHICLE SPECIAL FUNCTION | | L | |
|-------------------------|--|--------|-------------------------------|--|----|-------------------------------|----------|---------------------|----------|
| Country code | | xx | Pedal cycle | | 01 | Not applicable | | 00 | |
| Year | | xxxx | Moped | | 02 | No special function | | 01 | |
| Accident ID | | xxxxxx | Motorcycle up to 125cc | | 03 | Taxi | | 02 | |
| | | | Motorcycle over 125cc | | 04 | SUV / off road vehicle | | 03 | |
| U-1 TRAFFIC UNIT ID | | H | xx | | | | | | |
| | | | Passenger car | | 05 | Vehicle used as school bus | | 04 | |
| | | | Minibus | | 06 | Vehicle used as scheduled bus | | 05 | |
| U-4 TRAILER | | H | | | | | | | |
| Not applicable | | 00 | Bus | | 07 | Military | | 06 | |
| Without trailer | | 01 | Coach | | 08 | Police | | 07 | |
| With trailer | | 02 | Trolley bus | | 09 | Ambulance | | 08 | |
| Unknown | | 99 | Goods vehicle under 3.5t | | 10 | Fire truck | | 09 | |
| | | | Goods vehicle over 3.5t | | 11 | Dangerous goods vehicle | | 10 | |
| | | | Road tractor | | 12 | Unknown | | 99 | |
| U-5 ENGINE POWER | | L | | | | | | | |
| Not applicable | | 000 | Agricultural tractor | | 13 | Special vehicle (A) | | 52 | |
| Engine power | | xxx | Tram/light rail | | 14 | | | | |
| Unknown | | 999 | Ridden animal | | 15 | | | | |
| | | | Other motor vehicle | | 16 | U-7 VEH. DRIVE | L | U-8 MAKE | L |
| | | | Other non-motor vehicle | | 17 | Not applicable | 00 | Not applicable | 000 |
| | | | Pedestrian | | 18 | Left hand drive | 01 | Make | xxx |
| | | | Unknown | | 99 | Right hand drive | 02 | Unknown | 999 |
| | | | | | | Unknown | 99 | | |
| U-6 ACTIVE SAF. EQUIPM. | | L | | | | | | | |
| Not applicable | | 00 | Two wheel motor vehicle (A) | | 51 | | | U-10 REGIST. | H |
| Active safety equipment | | code | Bus/minibus/coach/trolley (A) | | 52 | | | YEAR | |
| Other | | 98 | Goods vehicle (A) | | 53 | U-9 MODEL | L | Not applicable | 0000 |
| Unknown | | 99 | | | | Not applicable | 00 | Year | xxxx |
| | | | | | | Model name | | Unknown | 9999 |
| | | | | | | Unknown | 99 | | |



TRAFFIC UNIT RELATED VARIABLES (2)

| U-11 TRAFFIC UNIT MANOEUVRE | | | | | | H |
|---------------------------------|--|--|--|----|---|----|
| Vehicle manoeuvres: | | Changing lane to left | | 13 | Pedestrian manoeuvres: | |
| Not applicable | | 00 Changing lane to right | | 14 | Crossing (on pedestrian crossing) | 21 |
| Reversing | | 01 Avoidance manoeuvre | | 15 | Crossing (on other point) | 22 |
| Parked | | 02 Overtaking vehicle on its left | | 16 | Walking on the carriageway, facing traffic | 23 |
| Entering a parking position | | 03 Overtaking vehicle on its right | | 17 | Walking on the carriageway, back to traffic | 24 |
| Leaving a parking position | | 04 Going round left hand bend | | 18 | Standing or playing on the carriageway | 25 |
| Waiting to go ahead but held up | | 05 Going round right hand bend | | 19 | Not on the carriageway | 26 |
| Slowing or stopping | | 06 Straight forward/normal driving | | 20 | Lying on the carriageway | 27 |
| Moving off | | 07 Entering/leaving parking position (A) | | 51 | Entering or getting out of a vehicle | 28 |
| U turn | | 08 Waiting to turn (A) | | 52 | Crossing (A) | 56 |
| Waiting to turn left | | 09 Turning (A) | | 53 | Walking or standing on the carriageway (A) | 57 |
| Turning left | | 10 Changing lane (A) | | 54 | | |
| Waiting to turn right | | 11 Overtaking (A) | | 55 | Other | 98 |
| Turning right | | 12 | | | Unknown | 99 |

| U-12 FIRST POINT OF IMPACT | | L | U-13 FIRST OBJECT HIT IN | | L | U-14 FIRST OBJECT HIT OFF | | L |
|----------------------------|--|----|-------------------------------|--|----|----------------------------------|--|----|
| No impact | | 01 | CARRIAGEWAY | | | CARRIAGEWAY | | |
| Left front | | 02 | Not applicable | | 00 | Not applicable | | 00 |
| Centre front | | 03 | None | | 01 | None | | 01 |
| Right front | | 04 | Object from previous accident | | 02 | Road sign/traffic signal | | 02 |
| Right side | | 05 | Parked vehicle | | 03 | Lamp post | | 03 |
| Right rear | | 06 | Bridge | | 04 | Pole | | 04 |
| Centre rear | | 07 | Bollard/refuge | | 05 | Tree | | 05 |
| Left rear | | 08 | Central island of roundabout | | 06 | Bus stop/shelter | | 06 |
| Left side | | 09 | Kerb | | 07 | Central crash barrier | | 07 |
| Unknown | | 99 | Animal (except ridden animal) | | 08 | Crash barrier beside carriageway | | 08 |
| Front - not specified (A) | | 51 | Other object | | 09 | Ditch | | 09 |
| Rear - not specified (A) | | 52 | Unknown | | 99 | Parked vehicle | | 10 |
| | | | | | | Stone/rock/mountain side | | 11 |
| | | | | | | Fence | | 12 |
| | | | | | | Submerged in water | | 13 |
| | | | | | | Other permanent object | | 14 |
| | | | | | | Unknown | | 99 |

| U-15 INSURANCE | | L | U-16 HIT & RUN | | H | U-17 REG. COUNTRY | | H |
|-------------------------|--|----|----------------|--|----|-------------------|--|-----|
| Not applicable | | 00 | Not applicable | | 00 | Not applicable | | 000 |
| Insured for vehicle | | 01 | Not Hit & Run | | 01 | Country code | | xxx |
| Not insured for vehicle | | 02 | Hit & Run | | 02 | National (A) | | 501 |
| Unknown | | 99 | Unknown | | 99 | Foreign (A) | | 502 |



PERSON RELATED VARIABLES (1)

| A-1 ACCIDENT ID | | H | U-1 TRAFFIC UNIT ID | | H | xx | P-2 AGE | | H | P-3 GENDER | | H |
|-----------------|--|--------|---------------------|--|---|----|---------|--|-----|------------|--|----|
| Country code | | xx | | | | | Age | | xxx | Male | | 01 |
| Year | | xxxx | P-1 PERSON ID | | H | xx | Unknown | | 999 | Female | | 02 |
| Accident ID | | xxxxxx | | | | | | | | Unknown | | 99 |

| P-4 NATIONALITY | | H | P-5 ROAD USER TYPE | | H | P-6 INJURY SEVERITY | | H |
|---------------------------|-----|-----|--------------------|--|----|---------------------|--|----|
| Nationality code | | xxx | Driver | | 01 | Fatally injured | | 01 |
| National | (A) | 951 | Passenger | | 02 | Seriously injured | | 02 |
| Foreigner, within the EU | (A) | 952 | Pedestrian | | 03 | Slightly injured | | 03 |
| Foreigner, outside the EU | (A) | 953 | Unknown | | 99 | Not injured | | 04 |
| Foreigner, not specified | (A) | 954 | | | | Unknown | | 99 |
| Unknown | | 999 | | | | Injured (A) | | 51 |

| P-7 ALCOHOL TEST | | L | P-8 ALC. TEST SAMPLE TYPE | | L | P-9 ALCOHOL TEST RESULT | | H |
|------------------|--|----|---------------------------|--|----|-------------------------|--|----|
| Not applicable | | 00 | Not applicable | | 00 | Not applicable | | 00 |
| Tested | | 01 | Blood sample | | 01 | Positive | | 01 |
| Not tested | | 02 | Breath sample | | 02 | Negative | | 02 |
| Unknown | | 99 | Unknown | | 99 | Unknown | | 99 |

| P-10 ALCOHOL LEVEL | | H | P-11 DRUG TEST | | L | P-12 DRIVING LICENSE ISSUE DATE | | H |
|--------------------|--|-----|----------------|--|----|---------------------------------|--|--------|
| Not applicable | | 000 | Not applicable | | 00 | Not applicable | | 000000 |
| Level | | xxx | Positive | | 01 | Year / month | | xxxxxx |
| Unknown | | 999 | Negative | | 02 | Unknown | | 999999 |
| | | | Not tested | | 03 | Years&months of driv. exp. (A) | | 00xxxx |
| | | | Unknown | | 99 | | | |



PERSON RELATED VARIABLES (2)

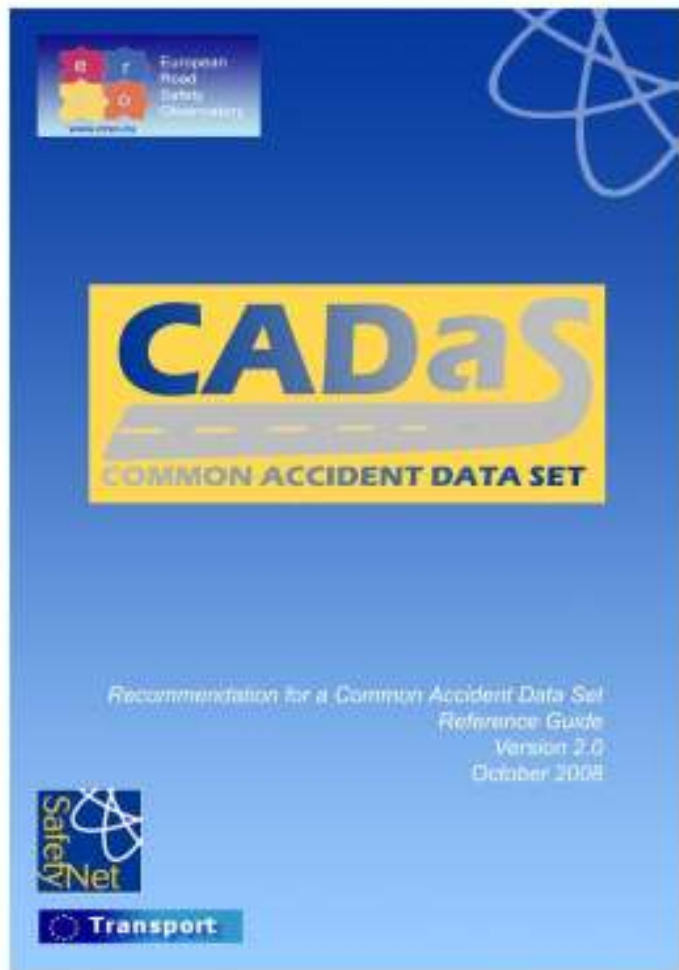
| P-13 DRIVING LICENSE VALIDITY | | L | P-15 SEATING POSITION IN/ON VEHICLE | | H | P-16 DISTRACTED BY DEVICE | | L |
|--------------------------------------|--|----|-------------------------------------|--|----|---------------------------|--|----|
| Not applicable | | 00 | Not applicable | | 00 | Not applicable | | 00 |
| Appropriate driving license | | 01 | Driver | | 01 | Not distracted by device | | 01 |
| Inappropriate driving license | | 02 | Front seat | | 02 | Telecommunication device | | 02 |
| Only driving lesson or driving test | | 03 | Rear - seated | | 03 | Other electronic device | | 03 |
| Invalid or suspended driving license | | 04 | Rear - standing | | 04 | Unknown | | 99 |
| No driving license | | 05 | Rear - not specified (A) | | 51 | | | |
| Unknown | | 99 | Elsewhere | | 05 | | | |
| Invalid or no driving license (A) | | 51 | Unknown | | 99 | | | |

| P-14 SAFETY EQUIPMENT | | H | P-17 PSYCHOPHYSICAL / PHYSICAL IMPAIRMENT OR CONDITION | | L |
|---|--|----|--|--|----|
| Not applicable | | 00 | Not applicable | | 00 |
| Seat belt worn no airbag in vehicle | | 01 | Good | | 01 |
| Seat belt worn and airbag released | | 02 | Inattention / absence of mind / Worried | | 02 |
| Seat belt worn and airbag not released | | 03 | Tired / fall asleep | | 03 |
| Seat belt not worn and airbag released | | 04 | Illness / Sudden illness / Lost consciousness | | 04 |
| Crash helmet worn | | 05 | Defective eyesight / hearing | | 05 |
| Child safety seat facing forwards used | | 06 | Dazzled by sunlight / headlights | | 06 |
| Child safety seat facing backwards used | | 07 | Others | | 07 |
| No use of safety equipment | | 08 | Unknown | | 99 |
| Other | | 09 | | | |
| Unknown | | 99 | | | |

| P-18 TRIP / JOURNEY PURPOSE | | L |
|---|--|----|
| Not applicable | | 00 |
| Route to / from school - education / work | | 01 |
| Driving as part of the work | | 02 |
| Leisure / Entertainment / Shopping | | 03 |
| Holiday | | 04 |
| Driving lesson | | 05 |
| Other | | 06 |
| Unknown | | 99 |



CADaS REFERENCE GUIDE



The CADaS uses comprehensive annexes (diagrams, sketches, free text, value lists)

- Annex A: Eurostat NUTS
- Annex B: Junction at grade diagram
- Annex C: Interchange diagram
- Annex D: Accident type sketches
- Annex E: Motor vehicle makes
- Annex F: Countries of the world
- Annex G: E-roads
- Annex H: Active safety equipment systems
- Annex I: List of variables and values

CONCLUSIONS

- Use of a holistic approach.
- Complete proposal of 73 variables and 471 values grouped into four basic categories.
- Flexible format to allow gradual adoption.
- Minimum set of comparable among countries accident data.
- Tool for benchmarking road accident data collection.
- Need for a pilot phase for the CADaS implementation.

CADaS could be a solid basis for the development of the respective World CADaS



CADaS - A common road accident data framework in Europe

G.Yannis, P.Evgenikos, A.Chaziris
National Technical University of Athens

4th IRTAD CONFERENCE

***Road safety data: collection and analysis
for target setting and monitoring performances and progress***



Seoul, 16-17 September 2009