Road Collision Data Collection in Ireland and International Benchmarking

A report for the National Roads Authority

November 2012

Issue 1

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leave nothing to chance

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Executive summary

The Irish Department of Transport, Tourism and Sport (DTTAS) is responsible for road safety and the current Road Safety Strategy 2007-12 is coming to an end. Later this year the Road Safety Strategy for the period 2013-2020 will be developed. As part of the process of providing input into the development of the future Road Safety Strategy, the National Roads Authority (NRA) is reviewing how road collision data is collected, and analysing road collision contributory factors to identify priorities for work going forward.

Risk Solutions was commissioned by the NRA to provide additional consultancy support to their thinking in this area. The scope of this support included:

- benchmarking of data collection processes against international practice in selected countries (Germany, Hungary, Netherlands, Norway, Sweden and the United Kingdom)
- a review of road collision data collection processes in Ireland
- analysis of contributory factors recorded in the historical road collision datasets.

In this report we report on the first two of these areas. A detailed report on the third area has been published separately[1].

In general we have found that the processes for collecting road collision data in Ireland are in line with good practice elsewhere within Europe. The content of the road collision data forms is amongst the best of those we looked at.

There are some weaknesses associated with the Garda PC16 road collision data returns but these are experienced by most countries we considered in this research. Best practice police road collision data collection is movement towards an IT-based on-site data collection system but this is an expensive and longer term project. Current proposals to improve the PC16/PULSE system are eminently sensible and will address some of the known weaknesses.

The LA16 process was developed to improve the quality of information for fatal and serious road collision. This was driven by limitations in the quality of information recorded in the historical CT68 forms (as the PC16 was known at the time), especially road collision location and comments on technical road related issues that were made by non-technical staff. The LA16 process was also intended to improve and encourage relationships between the Gardaí and Local Authority Engineers. In practice it has provided a useful supplementary data source for fatal road collisions only as resource constraints has meant that joint site visits have not taken place for serious road collisions. The data provided in the LA16 forms is not as detailed as the information that is derived from specialist road collision investigation teams that operate in some countries. For example, in Scandinavia, contributory factor analysis of fatal collisions is being addressed through the establishment of a network of regionally based road collision investigation teams. It is probably not feasible to introduce a new investigation team in Ireland, but there are some simple changes that could be made to the way the LA16 form is completed that would improve the NRA's ability to analyse contributory factors.

In the companion Contributory Factors Analysis report we recommend that during any joint site investigation following a fatal road collision, the Local Authority engineers should be encouraged to discuss road collision contributory factors with the accompanying Garda, and that the nature of these discussions should be recorded on the LA16 form. This does not require the LA Engineers to make explicit judgements about the root causes of the road collision but would provide an indication of the possible causes and this would be valuable when we look for trends or possible underlying common factors over a large population of such records.

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[1] Contributory factors analysis for road traffic collisions, Issue 2, Risk Solutions, November 2012

In the companion report we also recommend that the LA16 process should be extended to cover serious road collisions as well as fatal. This will demand additional resources and consequently Gardaí and Local Authority Engineers will need to decide jointly whether or not it is a good use of a finite resource.

We also recommend that the NRA should investigate the feasibility of getting access to root cause information contained in the Gardaí forensic reports that are produced for all fatal road collisions. It is felt that this would provide valuable additional road collision information, beyond that provided by PC16/PULSE.

Where we have identified areas where the road collision data collected could be improved, most of the improvements can be realised by joining up datasets in a smarter way through the application of geospatial analysis tools for example. It is recommended that the NRA investigate the feasibility of application of such tools, taking into account the costs of appropriate IT equipment and software licences, as well as the competences needed to use the tools.

In particular there are potentially enormous benefits to be realised by joining up the road collisions data with:

- better exposure data (vehicle kilometres travelled)
- a roads asset register
- medical records
- vehicle registration
- driver licensing.

In these cases there would be no need to make any modification to the PC16 forms but there will need to be time spent with the appropriate stakeholders and policy makers at Department level, to ensure that it happens.

We believe that there are significant road safety benefits that can be realised by re-launching the Collision Prevention Programme (CPP) with committed resources from all the relevant parties (RSA, the NRA, the Gardaí and LAs) and that this should form a lynch pin in the forthcoming road safety strategy.

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1 INTRODUCTION

1.1 The Irish Department of Transport, Tourism and Sport (DTTAS) is responsible for road safety and the current Road Safety Strategy 2007-12 is coming to an end. Later this year the Road Safety Strategy will be developed for the period 2013 to 2020. As part of the process of providing input into the development of the future Road Safety Strategy, the National Roads Authority (NRA) is reviewing how road collision data is collected, and analysing road collision contributory factors to identify priorities for work going forward.

1.2 Risk Solutions was commissioned by the NRA to provide additional consultancy support to their thinking in this area. The scope of this support included:

- benchmarking of data collection processes against international practice in selected countries (Germany, Hungary, Netherlands, Norway, Sweden and the United Kingdom)
- a review of road collision data collection processes in Ireland
- analysis of contributory factors recorded in the historical road collision datasets.

1.3 The ultimate aim of the project is to help the NRA prioritise safety investment and play its role in helping Ireland match the best performing countries in Europe and the rest of the world. This requires a clear understanding of what is driving road safety risk for particular groups of drivers and how to reduce the risk by changing attitudes and behaviours, as well as 'engineering out' the risk by making the roads and vehicles safer.

1.4 The main project outputs would be:

1. A detailed project report that:
   - critically examines historical international best practice in the areas of collecting and analysing accident data
   - makes detailed recommendations for how the authorities should build on this to gather important data (without placing an unreasonable burden on the Gardaí and other agencies)
   - identifies priority areas for improving road safety in Ireland – particularly relating to road features and in other areas within the ambit of the NRA, taking into account the requirements of the EU Directive on road safety management[2].
2. A second report that:
   - demonstrates how the data can be analysed to identify the impact of contributory factors on accident risk
   - records the processes and lessons learned in providing this data analysis support – so that the NRA data analysis team can repeat it in the future
   - discusses how exposure data (vehicle kilometres) is used in this process, and comments on the quality if this at present.

1.5 Support and guidance to the NRA data analysis team on any additional cleansing and manipulation of the available datasets (beyond what has already been done) to facilitate and support analysis of the road accident contributory factors.

Background

1.6 Ireland, along with most other European countries, has seen a significant reduction in the number of casualties from road traffic accidents over recent years. Maintaining this trend is likely to prove challenging with fewer accident hotspots to tackle and reduced funding available, so greater emphasis needs to be placed on analysing the risk and identifying

[2] Directive 2008/96/EC of the European Parliament and of the Council of 19 November 2008 - on road infrastructure safety management.

contributory factors. The EU Directive on road safety management recognises this trend through the requirement for Road Safety Inspections (RSI) which is a proactive rather than reactive approach.

1.7 The National Roads Authority (NRA) is seeking to collate and analyse road traffic accident data from a variety of sources, in order to identify important contributory factors and hence prioritise initiatives to improve road safety in the future. Previous analysis by the Road Safety Authority (Road Safety Strategy 2007-2012) identified excessive speed, impairment due to alcohol, drugs or fatigue and failing to use seatbelts or child safety restraints as primary factors increasing the likelihood or severity of road accidents. The proposed study is to assess the effect of a wide range of contributory factors acting alone, and in combination, on safety. The NRA is particularly keen to understand the contribution of road features to accidents to inform the development of its data collection processes. This may then inform what should be captured in any programme of RSIs for example.

Approach

1.8 One of the objectives of this research was to benchmark road collision data collection practices and processes from other countries with those in Ireland in order to assess whether or not there is anything being done elsewhere that Ireland can learn from. As well as providing useful input for continuous improvement of the NRA's data collection processes, it was judged that the outputs from the research would inform the NRA's approach to RSI, as required by the EU Road Safety Directive.

1.9 In order to constrain the benchmarking exercise to a practical number of countries it was agreed that it should be limited to Germany, Hungary, the Netherlands, Norway, Sweden and the United Kingdom. These countries were selected because:

- from a road safety risk performance perspective, they represented a selection of the best performing countries in Europe, and
- from the NRA's knowledge of international activities - through its participation in the Conference of European Directors of Roads (CEDR), there were known to be interesting data collection initiatives in some of the selected countries.

1.10 A wide selection of publicly available source materials was collated and reviewed. Key source materials included the EU funded SafetyNet project[3], the European Transport Safety Council (ETSC)[4], the Conference of European Directors of Roads (CEDR)[5] and ERA-NET Road[6].

1.11 In addition, the web-sites of the relevant National Road Authorities from the selected countries, and associated bodies, provided valuable reference materials.

[3] http://ec.europa.eu/transport/wcm/road_safety/erso/safetynet/content/safetynet.htm

[4] http://www.etsc.eu/home.php

[5] http://www.cedr.fr/home/index.php?id=2

[6] http://www.eranetroad.org/

2 IRELAND'S ROAD SAFETY PERFORMANCE IN CONTEXT

2.1 Over the last 15 years or so, Ireland has realised a significant improvement in its road collision safety performance. This is illustrated in Figure 1 which shows that the number of road fatalities per million population in 2010 was almost a third of what it was in 1996.

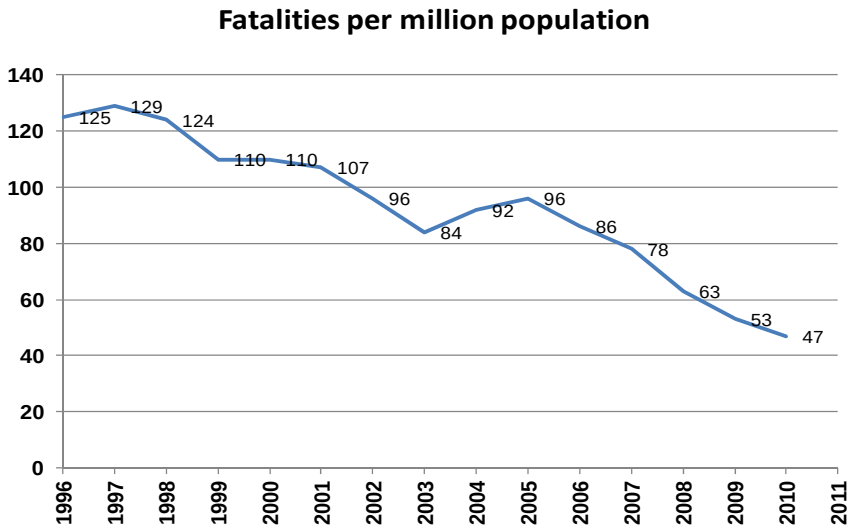
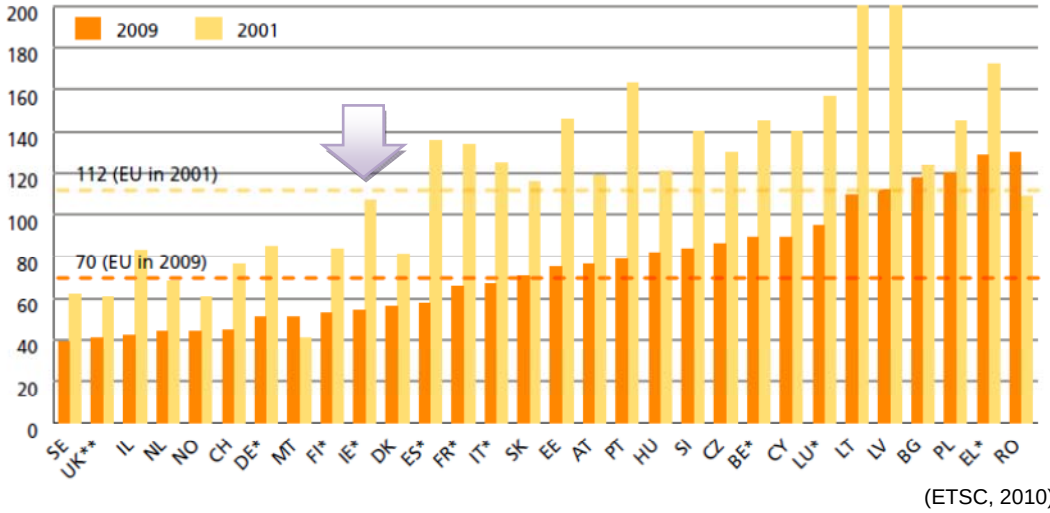


Figure 1 – Road collision fatalities per million population in Ireland

Source: Road Safety Authority, Road Collision Facts

2.2 We can compare how Ireland's road safety performance compares with other European countries through data reported by the European Transport Safety Commission (ETSC)[7].



(ETSC, 2010)

Figure 2 – Road deaths per million inhabitants in 2009 and 2001

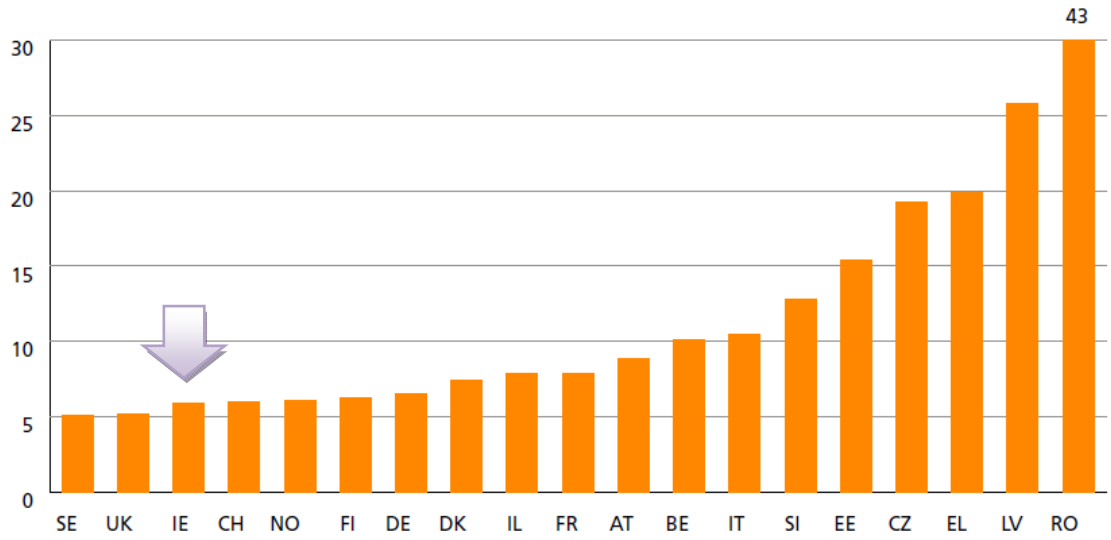
- * 2009: Provisional figures or national estimates based on provisional figures as final figures for 2009 were not available at time of going to print.
- ** UK 2009: ETSC estimate based on EC CARE Quick indicator for GB only.

[7] Road safety target in sight: making up for lost time, 4th Road safety PIN report, European Transport Safety Council (ETSC), June 2010

2.3 Figure 2 shows that the average number of road deaths per million inhabitants in European countries has reduced from 112 in 2001 to 70 in 2009 and that in both years, Ireland's road safety performance was better than the average. Various reasons have been suggested for why there has been an improvement in road safety over this period. Amongst the most commonly cited reasons are:

- increased enforcement (speeding and drink driving)
- shift in balance of vehicle kilometres driven to more motorway driving (as motorways have been built)
- improvements in vehicle crash worthiness (increasing likelihood of survival)
- improved medical interventions following road collisions resulting in increased survivability.

2.4 Ireland's good road safety performance is supported further in Figure 3 where the number of road collision fatalities is normalised by the estimated number of vehicle kilometres driven although this does presume that we have a good understanding of aggregate vehicle kilometres.



(ETSC, 2010)

Figure 3 – Number of road deaths per billion vehicle kilometres driven

Road deaths: average of years 2007, 2008, 2009

Estimated number of vehicle kilometres driven: 2008 or latest year

IT: Estimated number of vehicle kilometres driven is based on passenger cars only

2.5 According to Minister Dempsey[8]:

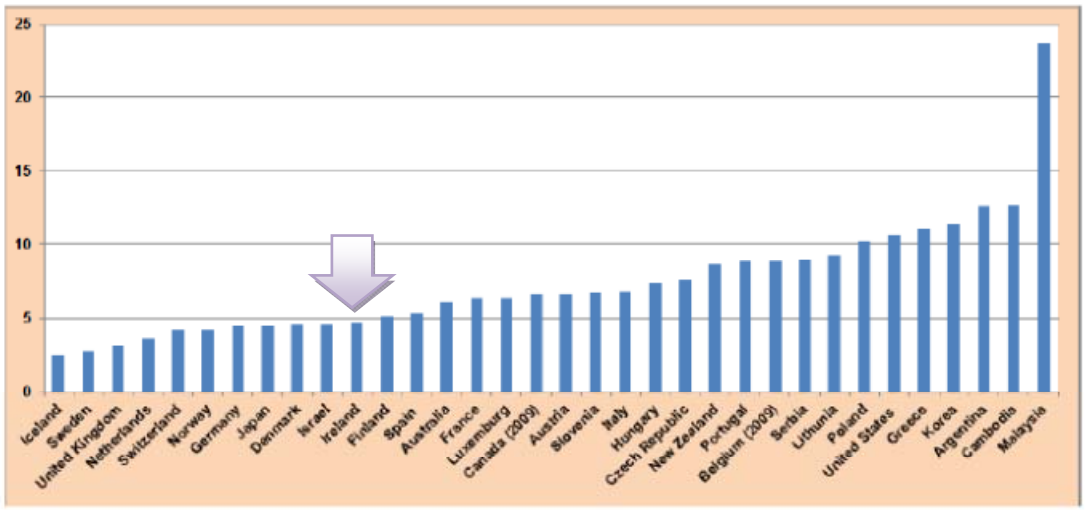
"Ireland's success was built largely on the adoption and effective implementation of our latest Government Road Safety Strategies Plans 2004-2006 and 2007-2012. In January 2006 the Taoiseach set up a Cabinet Level Committee on Road Safety chaired by the Minister for Transport and attended by five other Ministers, their supporting officials, the Attorney General, Garda Commissioner and the CEO of the RSA. This structure builds on political leadership and oversight political arrangements in best practice countries. The Road Safety Authority was set up with a core focus on developing, implementing and evaluating Ireland's road safety strategy.

The Government Road Safety Strategy 2007-2012 set the aim to reduce deaths, injuries and collisions on Irish roads by 30% and reduce to 60 road deaths per million inhabitants or a

[8] Road safety target in sight: making up for lost time, 4th Road safety PIN report, European Transport Safety Council (ETSC), June 2010

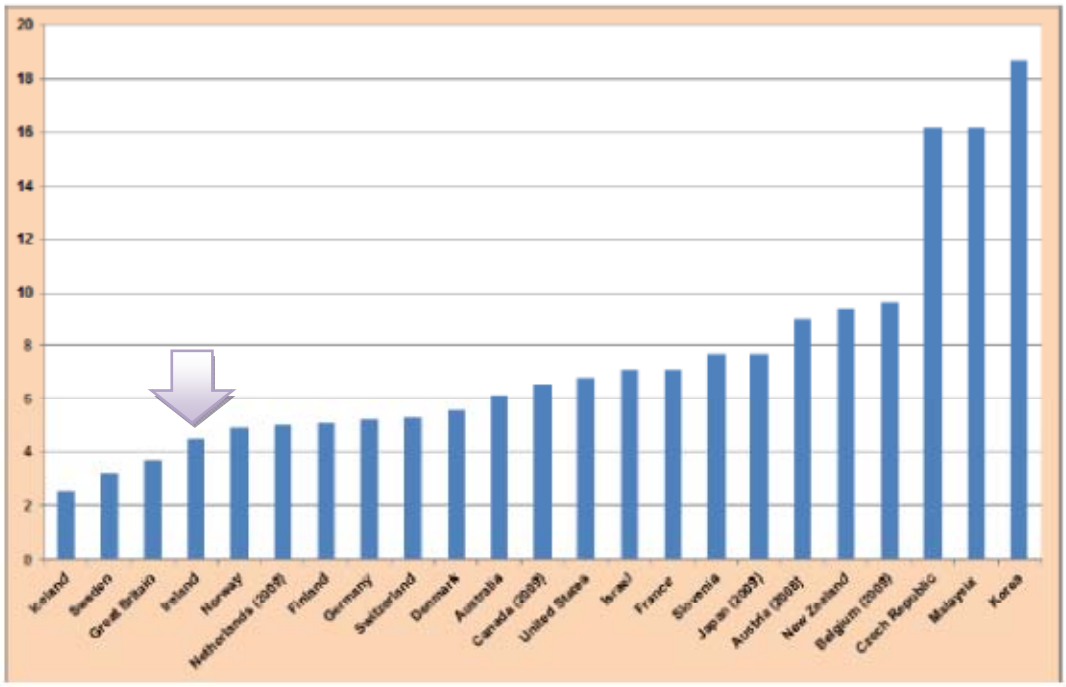
maximum of 252 deaths or better per year. With 241 people killed in 2009 (compared to 411 in 2001) this target has been achieved ahead of the deadline. The Road Safety Authority is committed to maintaining and improving on these targets in collaboration with all its partners in road safety especially the Irish public."

2.6 The OECD also publish data on road collision fatalities through the International Traffic Safety Data and Analysis Group (IRTAD). Figures 4 and 5 are taken from their most recent publication[9].



(IRTAD 2011 ANNUAL REPORT, © OECD/ITF, 2012)

Figure 4 – Road collision fatalities per 100,000 population in 2010.



(IRTAD 2011 ANNUAL REPORT, © OECD/ITF, 2012)

Figure 5 – Road collision fatalities per billion vehicle kilometres in 2010

9 Road Safety Annual Report 2011, The International Traffic Safety Data and Analysis Group (IRTAD), International Transport Forum, OECD.

2.7 The number of countries represented on Figure 5 is less than those represented in Figure 4 because not all countries collate vehicle kilometres systematically. The importance of good exposure data, and the implications for data collection in Ireland, is discussed in the companion report[10] to this.

2.8 The most noteworthy point from the safety risk statistics presented above is that by these measures, Ireland is performing currently amongst the best in Europe. This does not imply that the current safety risk performance is **'good enough'**, merely that it compares favourably with the other best performers in the EU. What should be done going forward is a matter of policy with a supporting road safety strategy. Current road safety strategies of benchmark countries are described later in this report.

[10] Contributory factors analysis for road traffic collisions, Issue 2, Risk Solutions, November 2012

3 ROAD COLLISION DATA COLLECTION IN BENCHMARK COUNTRIES

3.1 One of the objectives of this research was to benchmark road collision data collection practices and processes from other countries with those in Ireland in order to assess whether or not there is anything being done elsewhere that Ireland can learn from. In order to constrain the benchmarking exercise to a practical number of countries it was agreed that it should be limited to Germany, Hungary, the Netherlands, Norway, Sweden and the United Kingdom. These countries were selected because:

- from a road safety risk performance perspective, they represented a selection of the best performing countries in Europe, and
- from the NRA's knowledge of international activities - through its participation in the Conference of European Directors of Roads (CEDR), there were known to be interesting data collection initiatives in some of the selected countries.

3.2 There is an enormous amount of material available on the web-sites associated with:

- the EU funded SafetyNet project[11]
- the European Transport Safety Council (ETSC)[12]
- the Conference of European Directors of Roads (CEDR)[13]
- ERA-NET Road[14].

These were reviewed and relevant information extracted where appropriate.

3.3 In addition the web-sites of the relevant National Road Authorities from the selected countries, and associated bodies, have provided valuable source materials. The information gleaned from these materials has been supplemented by discussions and correspondence with the individuals presented in Table 1.

11 http://ec.europa.eu/transport/wcm/road_safety/erso/safetynet/content/safetynet.htm

12 http://www.etsc.eu/home.php

13 http://www.cedr.fr/home/index.php?id=2

14 http://www.eranetroad.org/

Table 1 – Key contacts from benchmarked countries

Name	Role	Organisation	Country
Peter Mak	Safety Advisor	Ministry of Infrastructure and the Environment Rijkswaterstaat Centre for Transport and Navigation	Netherlands
Stefan Matena	Department Head	Federal Ministry of transport, Building and Urban Development (BMVBS)	Germany
Markus Lerner	Senior Official	Federal Highway Research Institute (BASt)	Germany
Ingeborg Vorndran	Head of Division Road traffic Accidents	Federal Statistics Office	Germany
Marianne Rostoft	Road accident data analyst	Public Roads Administration	Norway
Elizabeth Mathie	Safety Risk Modelling Manager	Highways Agency	UK
Stuart Lovatt	Safety Action Plan Coordinator	Highways Agency	UK
Tibor Mocsári	Head of Department Road Safety and Traffic Engineering Department	Coordination Center for Transport Development	Hungary
Ylva Berg		Swedish Transport Administration (Trafikverket)	Sweden

3.4 Detailed findings from each country are presented in the following sections.

Germany

Road safety strategy

3.5 The Federal Ministry of Transport, Building and urban Development (BMVBS) has overall responsibility for the Road Safety Programme 2011[15]. The strategic focus of the Road Safety Programme is on three areas:

- **Human factors** - where the focus is on those road users who are most at risk, while simultaneously tackling those who pose the greatest risks.
- **Infrastructure** - where the focus is on making locations with high collision rates more 'forgiving' and, by deploying innovative technology to improve traffic flow.
- **Automotive engineering** – here the Ministry wants to encourage the greater spread of intelligent safety systems, which can make a significant contribution towards accident prevention.

3.6 Responsibility for delivery of the road safety programme lies with the Federal States (Länder) and local authorities. The Länder have direct responsibility for maintenance and operations of the federal trunk roads in their own state. In 2011, the Federal Government allocated €395 million for the conversion and upgrading of federal trunk roads (motorways and federal highways). These funds were allocated to finance works whose purpose is primarily to improve road safety and/or enhance capacity.

Key organisations

The Federal Highway Research Institute (Bundesanstalt für Straßenwesen - BASt)

3.7 The Federal Highway Research Institute (BASt) is a technical and scientific institute of the Federal Ministry of Transport, Building and Urban Development (BMVBS). It undertakes research for the Ministry on technical and traffic-related issues and has an important role in developing regulations and standards. Research areas include:

- Improvement in road construction and maintenance methods
- Improvement in construction and maintenance methods for bridges and civil engineering structures
- Road safety improvement
- Improvement in road utilisation
- Improving the environmental impact of building methods, reducing pollution
- Reduction in vehicle-related energy consumption and pollution, and the use of new sources of energy and alternative drive concepts
- The role of the road network within the overall transport system

3.8 BASt operates test facilities, provides consulting services and assessment reports and also evaluates / accredits the quality of services and products.

DeSTATIS (Formerly Statistisches Bundesamt - STBA)

3.9 The Federal Statistical Office (DeSTATIS) is the organisation that gathers, collects, processes, presents and analyses statistical information, including that on road safety on behalf of the Federal Republic of Germany. The Research Data Centre, which was introduced in 2007, was designed to provide researchers with regulated access to official statistical microdata.

[15] http://www.bmvbs.de/SharedDocs/EN/Artikel/STB-LA/road-safety-programme-2011.html?nn=37274

Road collision data collection and analysis

Who is responsible for collecting road collision data?

3.10 In Germany, traffic accidents are documented by the police. Evidence is collected for forensic experts as well as for federal statistics held by Statistisches Bundesamt (STBA). Federal statistics are established on traffic accidents on public roads. The recording criterion is at least one tow-away vehicle as a result of the accident.

3.11 Any road collision reported to the police triggers data collection. The Federal nature of Government in Germany means responsibility for data collection is a State level responsibility. In general, data collection is undertaken electronically by the State police although the processes and analyses of this data are localised. The data is collected and analysed by the statistical offices of the Länder level before passing up to the relevant Federal statistical office where it is then aggregated to generate the national picture.

What information is collected?

3.12 Data is collected for all road collisions reported to the police. The detail collected for 'accidents involving personal injury' and 'severe accidents involving material damage' [16] is more comprehensive than for 'other material damage incidents' where only the location of the incident is recorded. A typical mix of incident reference material, nature of the road collision, numbers of parties involved and the severity of their injuries is recorded.

3.13 Inevitably, as different police forces have been involved in collecting road collision data, historically the data quality has been mixed. This was addressed by a national training campaign on the importance of this data and this has improved data consistency and quality.

3.14 A recognised weakness in the police accident reports was the fact that they do not provide much information about the root causes of the accidents and how the injuries are caused. To address this, a specific project called GIDAS[17] (German in-depth accident study) was initiated in 1999. GIDAS involves carrying out specialist in-depth accident investigations immediately after the accident occurs and collecting more detailed information about the accident scenario and medical details about injuries and treatments, than the police records.

3.15 The GIDAS project is supported by the Federal Highway Research Institute (BASt) and the German Association for Research in Automobile Technology (FAT) which represents Ford, VW, Daimler, BMW, GM, Porsche, Autoliv, TRW, and JCI.

3.16 The GIDAS data is collected from a selection of road accidents in two geographical areas: Hanover and Dresden. Care is taken to collect data from a statistically significant number and range of accidents per year (typically 1,000 per year at each location), so that national road safety issues can be inferred. The GIDAS data is collected by the accident research units at the Medical University of Hanover (MUH) and at the Technical University of Dresden (TUD). The on-scene investigation is done by professional and semi-professional team members. Accident investigations are covered during two six-hour shifts that follow a two week cycle. A shift team consists of two technicians, a doctor and a coordinator.

3.17 The GIDAS data is only available to membership organisations. It does not contribute to the official national statistics. The costs associated with the programme are not publicly available.

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16 In Germany, road collisions are sub-divided according to: accidents involving personal injury; severe accidents involving material damage; other accidents involving material damage. Since 1995 the definition of severe accidents involving material damage are 'accidents where there has been a traffic violation and at least one vehicle cannot be operated as a result of the damage caused by the accident.'

17 http://www.gidas.org/en

In what form is the data collected?

3.18 Most states now have at-site electronic gathering/completion of the data. Some still collect using manual notes which are then used to fill in the database back at the police station. Data is submitted to the Länder statistical office where it is transferred electronically to the State statistical office.

3.19 The GIDAS data is collected initially in a wide variety of forms, paper, photographs etc. About 500 to 3,000 data items per accident are recorded. All personal data is processed according to data protection regulations and the confidentiality of personal medical records is assured. All this information is stored anonymously in database produced using Scientific Information Retreival software. It is available in this form to GIDAS members for evaluation.

What is done with the data? (e.g. post processing, combination with other datasets)

3.20 DeStatis generates the national statistical office reports by aggregating the data gathered by the state statistical offices. General, aggregated data is available to the public and is published in annual reports and is accessible via the internet. In-depth, disaggregated data is available only to organisations that meet the strict requirements of the law on data protection. Additionally selected accident data is given to the international network of police reported accident data : IRTAD[18].

3.21 BASt combines road collision data with The Federal Highway Information System (BISStra) which was developed to allow coordinated use of traffic flow, road condition, and road accident data for planning, administration and research. BISStra is a geographic information system (GIS) that describes the federal trunk road network and allows route specific accident analyses of motorways to be displayed. This information is published and made available to the Federal road authorities.

3.22 The potential benefits of linking road accident data to the vehicle registration and driver licensing databases is understood, but it is not clear if these discussions have been taking place at a Federal or Länder level. Irrespective of this little progress has been made as there is a concern that this could breach German data protection laws.

3.23 The federal system of government in Germany means that the data is post-processed by multiple organisations. Several organisations at the national (e.g. BASt) and regional (Länder) level, analyse accident data and each develops strategies for their own purposes.

How is the data (or results from specific research) used to inform safety decision making?

3.24 Responsibility for road safety priorities on German motorways and national roads lies with the Länder. For non-national roads this sits with local authorities. Funding these priorities is also the responsibility of the Länder and local authorities although (as indicated above) some supporting funding can be the provided from the Federal Government.

3.25 Local road collision data is used at the Länder and local authority level to populate infrastructure safety management decision support tools that will inform black spot management or network safety analysis. BASt provide data to the Länder on motorway route accidents.

3.26 The Federal Government analyses the national road collision data and the GIDAS database in targeted research where the objectives are to develop national road safety strategies, inform future legislation and to provide guidelines for the design and operation of road infrastructure.

3.27 The GIDAS data has been used by its membership to develop crash test programs and refine crash worthiness tests on new vehicles.

[18] http://internationaltransportforum.org/irtadpublic/index.html

What are the current road safety priorities in your country?

3.28 The BMVBS Road Safety Programme 2011[19] includes a detailed description of road safety priorities which focus on the following three areas:

- **Human factors** - where the focus is on those road users who are most at risk, while simultaneously tackling those who pose the greatest risks.
- **Infrastructure** - where the focus is on making black spots more 'forgiving' and, by deploying innovative technology to improve traffic flow.
- **Automotive engineering** – here the Ministry wants to encourage the greater spread of intelligent safety systems, which can make a significant contribution towards accident prevention.

Recent Initiatives, including those targeting single track roads

3.29 Rural roads account for about 25% of all personal injury road collisions but account for 60% of all fatalities associated with road collisions. There is some focus on making road collision black spots more forgiving to reduce the potential severity of such incidents although 80% of rural roads are regional, district or local roads and are therefore the responsibility of the relevant LAs.

3.30 On Federal State administered rural trunk roads, examples of engineering interventions to address road safety include:

- introduction of a third, overtaking, lane on the highway, where space permits
- edge rib lining on the edge of the carriageway to discourage run-off incidents
- introduction of standards for new roads and roads subject to conversion or upgrade, that prohibit roadside obstacles
- secondary rail systems to prevent motorcyclists sliding under safety barriers.

3.31 On motorways, examples of road safety engineering interventions include:

- edge rib lining on the edge of the carriageway to discourage run-off incidents
- provision of additional lanes on gradients
- deployment of more active traffic management systems at congested or road collision prone locations.

3.32 In addition to these examples, there is some emphasis being placed on improving road safety at roadwork sites.

[19] http://www.bmvbs.de/SharedDocs/EN/Artikel/STB-LA/road-safety-programme-2011.html?nn=37274

Hungary

Road safety strategy

3.33 Hungary's road safety strategy has developed entirely in line with the strategic objectives of the 4th European Road Safety Action Program. These had the following main strategic objectives:

- Improve education and training of road users
- Increase enforcement of road rules
- Safer road infrastructure
- Safer vehicles
- Promote the use of modern technology to increase road safety
- Improve emergency and post-care services
- Protect vulnerable road users

3.34 These strategic objectives are enshrined in the Road Action Safety Program 2011-2013[20].

3.35 Road safety improvements in Hungary have been realised through a range of measures including stricter enforcement of speeding and drink driving.

Key organisations

Coordination Center for Transport Development

3.36 The Coordination Center for Transport Development (CCTD) is the national roads authority in Hungary and is an agency of the Ministry of Economy and Transport. Its primary aim is to manage the funds of the road sector and the coordination of the transport branch. It provides professional and IT support to the Ministry and associated research centres.

Road collision data collection and analysis

Who is responsible for collecting road collision data?

3.37 The police are the only source of road collision data in Hungary. The police is organised at County level although Budapest has its own police force. There are 19 Counties in Hungary and 22 Districts in the capital Budapest. It is a statutory requirement (Gov regulation 215/2003. (XII. 10)) that all road collisions involving a personal injury must be recorded by the police.

3.38 The police attend any reported road collision and where there has been an injury, they complete the road collision data form. For material damage collisions, if both parties come to an agreement about responsibilities and the police are not called, no data is recorded. If the police are called because of some disagreement as to fault and responsibility, they complete a different road collision form which is much shorter and contains less information. This is not routinely passed onto the local roads administration office (at county level) but it can be made available for research purposes.

What information is collected?

3.39 There is nothing exceptional in the data collection forms. A typical mix of incident reference information, the circumstances associated with the collision, vehicle and person details are collected.

20 http://www.kfv.at/fileadmin/webcontent/Pressemappen/Verkehr/4rd_CEE_Round_Table/0410_01_Berta_Tamas_Measures_in_Hungary.pdf

3.40 Perhaps the only notable point is that with the exception of drugs and alcohol abuse by the collision **'causer'**, there appears to be only one field for identifying collision contributory factors. We presume that this is left up to the investigating officer to describe their impression of the collision cause.

In what form is the data collected?

3.41 Up until now the data has been collected in paper form by the police. The paper form is passed from the police to the local administration office where it is entered into an Excel spreadsheet and transmitted to the Central Statistical Office.

3.42 From June 2012, the police will start to collect road collision data using smart phone technology. Approximately 400 smart phones have been acquired (to be distributed across 19 Counties and 22 Districts) and a smart phone application has been specially developed for the smart phones that will support on-site data entry and capture. It is planned that the location information will be improved through use of the Global Positioning System (GPS) functionality in the smart phones.

Any known weaknesses in the data?

3.43 Historically accurate location of the road collision has been problematic. The police have often provided the street name or road number without indicating the section of the road that the collision took place on. Other issues that have been experienced include errors in the number of people injured in the road collision.

3.44 At present there are three levels of checking that help identify and correct errors in the road collisions data. Firstly the police should check the information recorded on the road collision data form. Secondly, the local roads administration at county level should check the road collision data for consistency. Thirdly the Central Statistical Office collate the national statistics and can compare with historical records for apparent anomalies.

3.45 The introduction of the smart phones as a mechanism for capturing road collision data by the police is expected to address many of these weaknesses.

What is done with the data? (e.g. post processing, combination with other datasets)

3.46 From June 2012 the national road collision statistics has been available on the internet (http://www.utadat.hu/). The data is being made available in this form for interested parties and research organisations to analyse the data as they see fit.

3.47 At present the road collision data can be combined with traffic flow data. This is currently an annual exercise and is undertaken by the Co-ordination Centre for Transport Development to inform future strategies.

3.48 A national roads Geographic Information System (GIS) database is currently under construction and the motorway network can be explored interactively on the following web-site (http://intermap.aak.hu/Sitecontent/Map/MapDefault.aspx?lang=en). The roads database contains lots of attributes such as road width, numbers of lanes, curvature etc. In time the intention is that all these databases can be combined to support analysis of the road collision data at a national level.

Which organisation has formal responsibility for reporting national statistics?

3.49 The Central Statistical Office is responsible for publication of all national statistics including road collision data. From June 2012 this data is being made available on the internet (http://www.ksh.hu/engstadat).

Who analyses the data?

3.50 The local roads administration office is responsible for analysing data at County level. This is to determine local needs through hot spot analysis. The CCTD will undertake analysis of road collision data for the national roads network to inform national priorities and overall strategy.

3.51 There are several research organisations, such as the Hungarian Transport Research Institute (www.kti.hu), that are commissioned to undertake road safety research. This type of analysis is not routine however and is usually to inform policy or strategy for a particular issue (e.g. prevalence of drink driving).

Examples of recent issues or campaigns?

3.52 At the national roads level, about two years ago there was a campaign to address safety risk on rural single carriageways. The engineering interventions undertaken were to paint solid lines down the middle of 2-lane carriageways to discourage overtaking when dual carriageways went down to single carriageways.

3.53 There has recently been a campaign to replace safety barriers on the hard shoulder with new ones. EU funds has helped this. At the moment there is some focus on the safety risks associated with lorry strikes on central barriers.

3.54 All EU funded schemes must be subject to evaluation. The CCTD are currently preparing these evaluation projects.

3.55 At the local level, recent road safety improvement schemes have included review of appropriate speed limits and installation of Variable Message Signs (VMS).

Funding of road improvement schemes

3.56 One of the CCTD's primary functions is to coordinate and allocate funds for road improvements. This covers both the national roads as well as local roads. CCTD takes responsibility itself for identifying which road improvement schemes should be undertaken on the national roads network. Funds for partial funding (up to 70%) of local road improvements are allocated on the basis of bids from the local authorities (municipalities) against a set of national priorities that are determined by the CCTD.

3.57 Note – that in the current economic climate, the Hungarian Government has not allocated any funds for road improvements so CCTD has no budget currently. There is a chance that the EU will provide some funding to support future road improvement schemes but this has not yet been agreed.

Netherlands

Road safety strategy

3.58 The Ministry of Transport, Public Works and Water Management is responsible for the Road Safety Strategic Plan 2008-2020[21]. There are three cornerstones to road safety policy over the coming years: cooperation; an integral approach; and sustainable safety.

3.59 The **Sustainable Safety Vision** was launched in the Netherlands in the early 1990s. Five guiding principles have been drawn up to support this vision and these are as follows:

Sustainable Safety Principle	Description
Functionality of roads	Monofunctionality of roads as either through roads, distributor roads, or access roads in a hierarchical road network.
Homogeneity of mass and/or speed and direction	Equality in speed, direction and mass at moderate and high speeds.
Predictability of road course and road user behaviour by as recognisable road sign	Road environment and road user behaviour that support road user expectations through consistency and continuity in road design
Forgivingness of the environment and of road users	Injury limitation through a forgiving road environment and anticipation of road user behaviour
State awareness by the road user	Ability to assess one's capability to handle the driving task

3.60 These principles recognise that road safety is everyone's responsibility and that all parties have a role to play in improving road safety.

3.61 Figures from Statistics Netherlands (CBS) and the Centre for Transport and Navigation (DVS) of the Ministry of Infrastructure and the Environment show that in 2010, there were 640 road fatalities in the Netherlands[22]. This compares with 720 road fatalities in 2009 and 750 in 2008 and indicates a reducing trend.

3.62 The Ministry has set itself a target of reducing the number of road fatalities to a maximum of 500 by 2020. This is ambitious, especially as the Netherlands is already a world leader in road safety. Several measures have been identified to achieve this reduction. First, those who jeopardise road safety (i.e. those who speed or drink and drive) will be dealt with more severely. Second, vulnerable road users (e.g. pedestrians, cyclists, children and the elderly) will be offered more protection.

3.63 Further information about the Ministry targets and the new measures being taken to reduce the number of road fatalities are outlined in the Strategic Road Safety Plan 2008-2020.

Key organisations

Rijkswaterstaat, Ministry of Infrastructure and the Environment

3.64 Rijkswaterstaat is the executive agency of the Dutch Ministry of Infrastructure and the Environment. On behalf of the Minister and State Secretary, it is responsible for the design, construction, management and maintenance of the national infrastructure (water and highways) networks in the Netherlands.

21 http://english.verkeerenwaterstaat.nl/english/Images/strategischplan-E_tcm249-249506.pdf

22 http://english.verkeerenwaterstaat.nl/english/topics/road_traffic_safety/

3.65 Rijkswaterstaat is responsible for about 5,700km (2,850 km bi-directional) of highway roads and these are used by about 3 million car drivers per day who account for 165 million vehicle kilometres per day. This equates to over 61 billion vehicle kilometres per year and averages about 60% of the national annual vehicle kilometres.

3.66 It is organised into ten regional departments (including 19 road districts and 16 water districts) and one project organization (Room for the River), and has five centres of excellence which support its work:

- Centre for Transport and Navigation
- Centre for Water Management
- Centre for Infrastructure
- Centre for Data and ICT
- Centre for Corporate Services.

3.67 The ten regional agencies put policy into practice and each regional agency is responsible for the maintenance, management and construction of roads and waterways in its region.

3.68 The five national agencies support the rest of the organisation with technical and scientific knowledge. This knowledge is used to prepare policy so that Rijkswaterstaat's Board can perform its duties properly. The Ministry of Infrastructure and the Environment also makes use of this knowledge.

Road collision data collection and analysis

Who is responsible for collecting road collision data?

3.69 Since the mid 70's the police have been the single source for collecting road collision data. The data is collected on paper at the scene of the incident and then later at their desks they enter the data into a police database.

3.70 The police records are the only sources of road collision data. Regional and local authorities do not collect any supplementary data.

What information is collected?

3.71 The content of the road collision data collection forms is defined by the Public Prosecutor.

In what form is the data collected?

3.72 Until 2011, data collection was paper based. Since then all road accidents involving casualties have been provided by the police to Rijkswaterstaat as Rich Text Format (RTF) files. This facilitates electronic processing of some data. However for the fields that involve narrative or descriptive text as well as sketches/observations by police officers, these require interpretation and Rijkswaterstaat contracts this out to research organisations such as SWOV[23].

3.73 The majority of road accidents involve material damage only and in these cases, only the date, time and location of the accident is provided with no other data fields. Material damage records are provided as Extensible Markup Language (XML) files.

3.74 Road accident location information is recorded in the Nationaal Wegen-Bestand (NWB). The NWB is a digital geographic database of all roads in the Netherlands that are managed by the government, provinces, municipalities and water boards.

Any known weaknesses in the data?

3.75 Under-reporting of road collisions data is a well known problem and there have been specific research activities undertaken to address this, as well as other specialist topics (e.g. level of severity of road accident injury).

[23] http://www.swov.nl/index_uk.htm

What is done with the data? (e.g. post processing, combination with other datasets)

3.76 Full copies of the police reports are provided to the Rijkswaterstaat who are responsible for entering the data into the road accidents database. Because the full police report is provided, there is private and potentially confidential information included in the reports. Any personal or private data is ignored and not entered into the database itself.

3.77 Rijkswaterstaat adds a limited amount of supplementary data to the police reports such as the GIS-attributes to enable the accident location to be mapped using GIS technology.

3.78 A limited amount of data validation is undertaken by Rijkswaterstaat on the police records. This includes self-consistency checks as well as other simple checks, e.g. age and driver's licence. In addition there are cross validation activities undertaken by comparing the road accident database with the database for hospital admissions.

3.79 By the end of March each year, three products are generated from the 'raw' road accident data. These are: BRON; BLIK and VOR, which are described further below. In addition to this, individual and bespoke queries can be run on the raw database for specific applications.

BRON - This is a set of files containing accident data on: casualties; parties; manoeuvres; location and GIS-allocation (Shape-file). This product contains a record of all road accidents recorded by the police. It is available for use by all Road Authorities (RAs) to monitor and manage their road safety performance. It is provided free of charge and there are a range of commercial software products available to undertake analysis of the data.

BLIK - This is a web-based application that shows the location of road traffic accident black spots based on the number of accidents last year as well as the previous three years. The black spots are identified on the national road map. Use of this tool is also free of charge.

VOR - This is a set of three documents drawn to monitor the road safety status of the highways network, i.e. those roads that Rijkswaterstaat is directly responsible for. Because of the reduced scope of this product it is primarily of interest to the Rijkswaterstaat and its regional directorates.

3.80 Rijkswaterstaat is able to derive a lot of relevant data by combining the road collision data from the police with that from other sources such as the vehicle registration database and also medical records. The database combination possibilities are as follows:

- Police reports – this is the basic road collision data
- Police reports + vehicle registration data – this is undertaken only once a year to obtain some vehicle characteristics associated with road collisions
- Police reports + vehicle registration data + driver's licence registration system – this has been undertaken for specific studies only and is not publicly available
- Police reports + hospital admission data – this is undertaken once per year only to estimate the numbers of casualties and to determine the severity of the casualties. This work is undertaken by the Institute for Road Safety Research (SWOV[24]).

Which organisation has formal responsibility for reporting national statistics?

3.81 Rijkswaterstaat is responsible for this. The only database that Rijkswaterstaat is directly responsible for maintaining is the police reports database. It has access to the other data sources through formal agreements with the relevant agencies.

Who analyses the data?

3.82 Rijkswaterstaat will analyse the data to identify potential black spots and to inform the short term work programme. This analysis tends to be of a routine nature. Specialist research

[24] http://www.swov.nl/index_uk.htm

activities are undertaken by external organisations such as the Institute for Road Safety (SWOV), and Statistics Netherlands (CBS).

3.83 Research into the physical and engineering related aspects of road collisions (e.g. vehicle technology, kinetic energy, physical impacts), is provided to Rijkswaterstaat by organisations such as Netherlands Organisation for Applied Scientific Research (TNO)[25].

3.84 Road user behavioural aspects are covered by experts in the Centre For Transport and Navigation (DVS) and also by institutes such as SWOV. When medical/physiological aspects have been analysed this has been undertaken in close co-operation with medical institutes.

How is the data (or results from specific research) used to inform safety decision making?

3.85 The results from analysis of the road collision data is used as the basis for advice to road authorities and policy makers.

3.86 Some analysis is carried out by contractors and some is done by experts within Rijkswaterstaat (primarily with DVS). The database and the derived products described above provide the 'basic information sets' but it is often the case that further analysis / interpretation / statistical work is required in order to provide useful input to road-authorities, policy and/or enforcement organisations.

3.87 The Dutch Strategic Road Safety Plan[26] demands that safety performance is monitored through many performance indicators. Much of the core data stored in the road collisions database is required in order to be able to monitor such progress.

3.88 In addition Rijkswaterstaat provides data from the roads collisions database to support various international research programmes and projects such as: EU-DRUID; ERSO; IRTAD; CARE; IRF/ERF; ETSC; UNECE; EURORAP / iRAP.

Funding of road improvement schemes

3.89 As far as investment in the infrastructure is concerned the priorities indicated in the Road Safety Strategic Plan 2008-2020 are:

- the Ministry will stimulate regional and local measures through broad state subsidy schemes
- improvements to the national road network will be marginal only and only when no environmental impact assessment is required
- introduction of essential recognisability features (see below) on non-motorways (national and secondary routes).

Examples of recent issues or campaigns

3.90 As described at the start of this section, the Dutch approach to road safety strategy is the so-called 'Sustainable Safety' approach. Generic measures for all traffic that are being adopted under this approach include **'self-explanatory roads'** which automatically cause drivers to maintain safer driving habits through:

- credible speed limits
- narrow roads
- clear road signage
- edge rib lining.

3.91 A project is currently underway that will give all roads new line markings known as the **'essential recognisability features'.** The line markings are consistent with the road categories as drivers already know them and the plan was that all national road line markings will have been updated by the end of 2010 and that all other roads will be competed by 2015.

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[25] http://www.tno.nl/index.cfm

[26] Road Safety Strategic Plan 2008 – 2020, Ministry of Transport, Public Works and Water Management

3.92 The following Figure has been extracted from a leaflet produced in the Netherlands to raise awareness of changes to the new road markings as they are rolled out across the Netherlands.

Double white centre lines with green

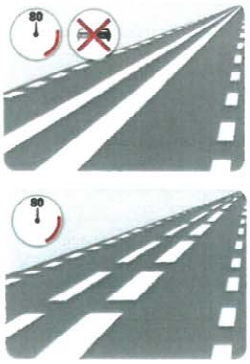
Maximum speed?

This is a semi-motorway. You may drive at 100 km/h except when traffic signs indicate a lower speed.

Overtaking?

- Continuous white centre lines: overtaking not allowed
- Broken white centre lines: overtaking is allowed, except if traffic signs forbid it. Overtake only if it is possible to do so safely.

Double white centre lines without green



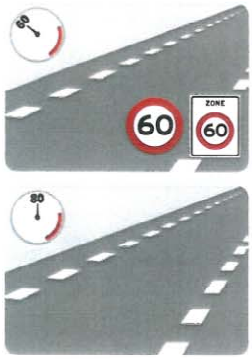
Maximum speed?

You may drive at 80 km/h except when traffic signs indicate a lower speed.

Overtaking?

- Continuous white centre lines: overtaking not allowed
- Broken white centre lines: overtaking is allowed, except if traffic signs forbid it. Overtake only if it is possible to do so safely.

No centre lines



Maximum speed?

- If there is a sign reading 60 or 60 by the side of the road, you may drive at 60 km/h.
- If there is no speed limit sign or 60 zone sign by the side of the road, you may drive at 80 km/h.

Overtaking?

Overtaking is allowed, except if traffic signs forbid it. Overtake only if it is possible to do so safely.

Norway

Road safety strategy

3.93 The Ministry of Transport and Communications is ultimately responsible for the Vision, Strategy and Targets for Road Traffic Safety in Norway 2006-2015[27]. The National Plan of Action for Road Traffic Safety 2010-2013 is elaborated by the Norwegian Public Roads Administration, the National Police Directorate, the Directorate for Health and Social Welfare, the Directorate for Education and training and the Norwegian Council for Road Safety.

3.94 The strategy is developed on the basis that **Vision Zero** should form the basis for road traffic safety activities in Norway. The Norwegian Vision Zero involves the entire transportation system. The overall objective of the vision is to reduce the number of accidents with particular focus on those accidents that can lead to fatalities and serious injuries. It is based on three corner stones:

Ethics - Every human being is unique and irreplaceable, and we cannot accept that between 200 and 300 persons lose their lives annually in traffic accidents.

Science - Human physical and mental capabilities are known and shall form a basis for road system design. Knowledge of our limited ability to master traffic and our tolerance in an accident shall be premises for chosen solutions and measures. The road system shall encourage safe road user behaviour and protect against fatal consequences of normal erroneous actions.

Responsibility - Road users and authorities have a joint responsibility for traffic safety. The road users are responsible for their own behaviour; they must be cautious and avoid conscious violation of rules. The authorities are responsible for offering a road system adapted for as safe behaviour as possible and protect against fatal consequences of unconscious erroneous actions.

Key organisations

Statens Vegvesen (Norwegian Public Roads Administration)

3.95 The Norwegian Public Roads Administration (NPRA) is responsible for the planning, construction and operation of the national and county road networks, vehicle inspection and requirements, driver training and licensing.

3.96 For national roads, the NPRA follows direction from the Ministry of Transport and Communications. For county roads, the Regional Director follows direction according to county legislature.

3.97 The NPRA falls under the leadership of the Directorate of Public Roads, which is an autonomous agency of the Ministry of Transport and Communication. The NPRA is organised in five regional offices.

Road collision data collection and analysis

Who is responsible for collecting road collision data?

3.98 There are two sources of road collision data collection in Norway:

1. The police record all reported road collisions where there has been a personal injury. These forms record what has happened but provide little insight into the underlying root causes or contributory factors.
2. The fatal road collisions database. This is collected by specialist investigation teams in the regions and is described in detail below.

[27] http://www.vegvesen.no/_attachment/58683/binary/2818

3.99 Road collision data is collected on paper only by the police. They have no plans to move towards a more IT based solution. The police records form the basis of all the official statistics and they are sent to Statistics Norway (the national official statistics body) who process it and cleanse it before passing on to the Norwegian Public Roads Administration (NPRA). The NRPA can combine this data with their own fatal accident investigation data and a GIS based roads asset register.

3.100 In 2005 the NPRA established accident study groups in each of its five regions to conduct in-depth studies of all fatal road collisions on the network. For all fatal road collisions, the police notify the NPRA straight away. A person from each district has been designated to collect information from the collision site and send it to the regional accident analysis group within 24 hours. The group then reviews the accident in detail and write a report. This report is then shared with the heads of the public roads administration, the regional heads and the heads at district level.

3.101 The purpose of establishing these teams was to learn more about what causes fatal accidents in order to inform better mitigation or control strategies.

3.102 The NPRA attaches a lot of importance to the accident investigation role and the NPRA staff are trained specially for this role.

What information is collected?

3.103 Whilst the police records provide a comprehensive description of what happened in the road collision, they say little about why? For this reason the accident study groups were set up. The fatal accidents database contains detailed information about the root causes and contributory factors for each fatal accident on all Norwegian roads since 2005.

In what form is the data collected?

3.104 The police collect the data on paper and then enter it onto the police national database back at the office. However they only get one attempt at loading up a new road collision record and so things like injury type or severity may not be marked correctly as it may not have been known at the site of the collision. The police national database is then ported electronically to Statistics Norway where it is cleansed and stripped of any confidential information before sending back to the NPRA for analysis.

Any known weaknesses in the data?

3.105 Police records do not have any contributory factors or root causes included in them. The severity of the injuries may not be properly recorded as it was unknown at the time.

What is done with the data? (e.g. post processing, combination with other datasets)

3.106 Whilst the focus of the regional accident analysis groups is on fatal collisions in their own region, the regional databases are collated together to produce a national fatal collisions database. It is up to the regional groups what use they make of the national database.

3.107 Currently there are moves towards linking the fatal collisions to the Norwegian Roads databank - which is a GIS based register of the roads infrastructure.

3.108 So far as we have been able to determine, the road collision data is not linked to driver's licence information or to medical records.

Which organisation has formal responsibility for reporting national statistics?

3.109 Statistics Norway[28] is the Government agency with formal responsibility for reporting road collision statistics.

[28] http://www.ssb.no/en/

Who analyses the data?

3.110 The NPRA provide data analysis support to all road authorities which includes the County administrators who took over operation and maintenance of all county roads from January 2010.

3.111 The road collision data is analysed locally but there is also a regional analysis group that gets together regularly to review any regional experiences and to share information. Outputs from the regional analysis group are used to inform the National Plan of Action.

How is the data (or results from specific research) used to inform safety decision making?

3.112 An in-depth study[29] of all fatal road collisions between 2005 and 2008 reported in 2010. This revealed that intoxication was a bigger problem than had previously thought to be the case, and that inadequate driving skill, in combination with excessive speed, were major contributory factors in road collisions. The severity of the collisions was dominated by hazardous items (e.g. trees and rocks) at the roadside.

3.113 As a result of this analysis, the NPRA has committed to a series of strategic measures targeting the road and road environment. These are enshrined in the National Plan[30].

Examples of recent issues or campaigns?

3.114 Short-term engineering interventions prioritised in the Vision, Strategy and Targets for Road Traffic Safety in Norway 2006-2015 included:

- the introduction of median barriers
- use of edge rib lining
- measures to make the roadside more forgiving.

3.115 Specific road improvement measures to be implemented according to the National Plan, include:

- Construct central dividers on 93 kilometres of two and three-lane national roads
- Continue work on traffic safety inspections and the immediate improvement of roads where numerous accidents, or very serious accidents, occur
- Finalise work on new criteria for speed limits outside urban areas.

Funding of road improvement schemes

3.116 Since January 2010, the county authorities took over ownership and responsibility of 17,000km of national roads meaning that at 44,000km the county road network accounts for over 50% of the total public roads network. The NPRA still provide a secretariat function for most county traffic safety committees where county plans for traffic safety are drawn up. Funding of any schemes in these plans must now come from the county themselves.

[29] In-depth analysis of fatal road accidents in Norway 2005-2008, Norwegian Public Roads Administration, March 2010.

[30] National Plan of Action for Road Traffic Safety, 2010-2013, Norwegian Public Roads Administration

Sweden

Road safety strategy

3.117 The Swedish road safety strategy is enshrined in the **'Vision Zero'** philosophy which was developed in 1995 and implemented by legislation in 1997 with the strategic objective of eliminating all fatal and serious injury road collisions by 2020. Experience since then has resulted in a revision to this aspiration and the current objectives are that in the period from 2007 to 2020, the number of fatalities should be reduced by 50% and the number of seriously injured by 25%.

3.118 The key aspects of this approach have already been described above under Norway.

Key organisations

Trafikverket

3.119 Trafikverket (the Swedish Transport Administration) is responsible for the construction, operation and maintenance of all state owned roads and railways. It was formed in April 2010 by merging the Swedish Rail Administration, the Swedish Road Administration and the Swedish Institute for Transport and Communications.

Road collision data collection and analysis

Who is responsible for collecting road collision data?

3.120 In Sweden, road collision data is collected in the Swedish traffic Accident Data Acquisition (STRADA) database. STRADA is a coordinated national registration of traffic accidents and traffic injuries run by the police and the health care authorities.

3.121 The police record data from road collisions where there has been an injury. They stopped collecting data on material damage collisions some time ago. Whilst, in principle insurance companies could be a source of data for material damage road collisions, this is not routinely undertaken.

3.122 For hospital admissions where the patient has been involved in a road collision, if the hospital has signed up to STRADA, the patient is asked to consent to release of their medical records for research purposes. If this consent is given then the hospital collects data associated with the collision. As of February 2011, the hospitals in 18 out of 21 counties reported to STRADA on a complete or partial basis. Consequently, the official road safety statistics are based exclusively on road collisions reported by the police.

3.123 The Swedish Transport Administration undertakes detailed investigations at the site of all fatal accidents within 48 hours of the incident. The focus of these investigations is to see if there were any infrastructure weaknesses.

What information is collected?

3.124 We are not aware of anything exceptional associated with the police road collision data collection. The information captured in the fatal accident investigations is very detailed and includes the findings from coroner investigations.

In what form is the data collected?

3.125 The police records can be on paper or on a personal digital assistant (PDA) before uploading into STRADA at the district level. The PDAs have been on trial for about five years and the police have been using STRADA nationally since 2003.

Any known weaknesses in the data?

3.126 Police records do not capture non-vehicular road collisions (e.g. cyclists) as these are not typically reported. The police records tend not to be good on injury severities.

3.127 The inclusion of hospital data means that the number of unreported road collisions, (mainly involving unprotected road users: pedestrians, cyclists and moped drivers), is reduced. In addition, the hospital reports broaden the knowledge of the injuries and their severity.

What is done with the data? (e.g. post processing, combination with other datasets)

3.128 All police districts have STRADA users who are responsible for loading up the police records to the national STRADA database. The same applies to hospitals who have signed up to STRADA.

3.129 There has been some effort recently to link the road safety statistics to a GIS based national database. This is hosted by the Transport Administration but we are not sure how well developed the interface is.

Which organisation has formal responsibility for reporting national statistics?

3.130 Statistics Sweden[31] is the official Government body for publishing road traffic collision statistics.

Who analyses the data?

3.131 The Swedish Transport Administration undertakes in depth investigations at the sites of all fatal road collisions. This is undertaken by a specialist team according to a very prescriptive protocol and within 48 hours of the incident. They look especially for evidence of infrastructure weaknesses. These investigations are also permitted to get access to information from the coroner's report.

3.132 There are six regions in Sweden and each region has a group who review the results from all the in-depth studies on a regular basis to see if there are any trends or lessons that can be learned for their region. We understand that the groups are made up of ~5 or 5 people.

3.133 There is an annual report on road safety performance in Sweden where the national performance against a set of road safety performance indicators and targets is reported and discussed.

3.134 Some research is undertaken in collaboration with car manufacturers but this tends to be very bespoke and focused on particular topics. Some of this research has been on-going for some time. An example of this would be on-going research with Volvo to enable the vehicle to 'read' the prevailing speed limit on any road, and also to recognise when the vehicle is departing from the road lane envelope. In both cases the vehicle would prompt the driver or warn them about the deviation. Both of these fall under the umbrella of Intelligent Speed Adaptation (ISA).

Examples of recent issues or campaigns?

3.135 In 2008, Sweden adopted a new speed limit system which incorporates a larger number of speed limits (10) between 30 km/h and 120km/h. Since Autumn 2008 there has been a programme of reviewing speed limits across rural roads and on 15,400 km or roads, lower speed limits have been implemented. The speed limits have been set on the basis of a new safety standard for roads based on the EuroRAP[32] classification and network speed limits are based on EuroRAP road protection scores.

3.136 Current strategy is that there should be no roads with a speed limit greater than 80 km/h where there is no median barrier to separate the traffic. If there are no median barriers, then they are looking to reduce the speed limit at those locations to an appropriate level.

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31 http://www.scb.se/default____2154.aspx

32 European Road Assessment Programme (http://www.eurorap.org)

3.137 There is no explicit safety plan but rather a set of performance indicators that will encourage the right 'direction of travel' to be consistent with the 'Vision Zero' philosophy. Examples of particular interventions highlighted on the Trafikverket web-site includes:

- Promotion of intelligent speed adaptation (to encourage compliance with reduced speed limits)
- Introduction of variable speed limits at 20 test sites
- Promotion of alcolocks to prevent drink driving (some corporations have started to install these on their vehicle fleet).

How is the data (or results from specific research) used to inform safety decision making?

3.138 The Swedish Transport Administration undertakes an annual analysis[33] of specific road safety performance indicators. The trends are then compared with targets for these indicators and a commentary provided on the direction of travel. The annual analysis report does not recommend any specific interventions but emphasises the need to maintain a 'systems' approach to managing road safety.

Funding of road improvement schemes

3.139 The Swedish Transport Administration is only responsible for the national trunk road network. Investments in regional roads are planned by county administrative boards, regional independent bodies and municipal collaborative organisations. The Transport Administration's budget is set by the Finance Ministry – there is no 'bottom up' evaluation of what the budget should be. Expenditure is then allocated to particular schemes according to need and availability of funds. Within the budget there is scope for subsidies to be paid to support investment in local roads. In 2010[34] the Swedish Transport Administration allocated 1.3% of its plan (i.e. 31 SEK million) to co-finance local authorities for 'road safety, environment, ITS and airport facilities'.

[33] Analysis of Road Safety Trends 2010, Management by Objectives for Road Safety Work, Towards the 2020 Interim Targets, Trafikverket, Swedish Transport Administration, April 2011

[34] Annual Report 2010, Swedish Transport Administration, February 2011.

United Kingdom

Road safety strategy

3.140 In May 2011, the Department for Transport (DfT) published its Strategic Framework for Road Safety[35]. This provides an overall framework for making decisions about road safety although it makes it clear that Local Authorities should have the freedom to make their own decisions on road safety according to local needs. In response to the DfT's strategic framework, the Highways Agency (HA) has published its Safety Framework for the Strategic Road Network 2011[36].

3.141 The DfT's vision is that Britain remains a world leader on road safety and is committed to ensuring that the improvements realised over decades and recent years, is maintained. Within this it aims to reduce the road safety risk to relatively high risk groups more quickly, in particular for cyclists and children from deprived areas. In the longer term the expectation is that improvements in technology (e.g. collision avoidance) will transform the way that road users drive and use roads, and protect all road users when things go wrong.

3.142 The HA's approach to road infrastructure safety management is to enhance its current approach by:

- providing further guidance on Road Safety Audits
- continue to develop the principles of making the use of roads easy to understand ('self explaining roads')
- to reduce the obstacles at the side of a road to limit the risks when drivers lose control of their vehicles
- ensure traffic signs on the network perform as intended
- avoid a proliferation of signs
- considering how best to make use of variable message signs to support the safe operation of our roads.

3.143 In addition to this, the HA has been reviewing and updating its maintenance contracts. The new contracts will be rolled out over the next four years and take into account the risk assessments associated with maintenance activities to allow the repair and replacement of features such as barriers to be prioritised.

3.144 A significant aspect of the HA's road safety strategy is associated with improving the health and safety of those who work on its roads and it has launched an 'Aiming for Zero' strategy to address this. It covers: office based staff; traffic officers; maintenance workers; road workers.

Key organisations

3.145 In the UK responsibility for the management and development of the road network is shared between **local authorities**, the **devolved administrations** of Scotland, Wales and Northern Ireland, and the **Highways Agency**. The HA is responsible for management and development of the Strategic Road Network in England which consists of approximately 7,000km of motorway and all purpose trunk roads. The following text refers to data collected to support the HA.

35 http://www.dft.gov.uk/publications/strategic-framework-for-road-safety

36 http://www.highways.gov.uk/knowledge/documents/N110040_-_Safety_Framework_for_the_Strategic_Road_Network_2011.pdf

Road collision data collection and analysis

Who is responsible for collecting road collision data?

3.146 The police record data for road collisions on all roads involving a personal injury using a form called STATS19. Some forces use a slightly modified version called the New Collision Report Form (NCRF). The NCRF contains some additional fields in comparison to STATS19 but the data is processed according to the STATS19 fields. This data forms the basis for all the formal road collision statistics reported in the UK.

3.147 There are 43 police forces in England and Wales and each is responsible for collection of the road collision data in their region although there is no formal or statutory obligation on them to do so[37].

3.148 In addition to the STATS19 records, the DfT and HA contracted with Transport Research Laboratories (TRL) and the Transport Safety Research Centre (TSRC) of Loughborough University to undertake detailed road accident investigation studies through the 'On The Spot' project which has ran from 2000 to 2009. During this period about 4,500 accident investigations have been undertaken. The project was suspended at the end of 2009 but we understand that a similar initiative called 'RAIDS' is about to be commissioned with the same contractors.

3.149 For these investigations both TRL and TSRC have dedicated teams who are responsible for attending a selection of police reported traffic accidents in a defined geographical location, centred at their offices, minutes after they have been reported. Both organisations undertake approximately 750 accident investigations per year. The OTS project is a big commitment with Phase 3 (2006-2009) costing approximately €4m[38].

3.150 Additional data around material damage road collisions is collected by the HA's Maintenance Area Contractors (MACs) and also in the Command and Control (C&C) database used by the Traffic Officers service. The former is used to inform billing to the HA but this is not coordinated centrally and there is no consistency across the MACs. The latter is only applicable to the motorways on the Strategic Road Network and is not widely used for gathering collision data. It is used more for operational purposes.

What information is collected?

3.151 A copy of the STATS19 form is attached as Appendix 1. It is a relatively comprehensive form and with over 70 contributory factors cited, it is the most detailed list in all the forms we examined.

3.152 For the OTS database, information is collected about the nature of the road collision and the environmental factors but in addition to this, supplementary data is collected from the police, hospitals, the Coroner's office, emergency services and vehicle recovery operators.

In what form is the data collected?

3.153 The STATS19 records are completed as paper copies by the police.

3.154 The OTS data is recorded on paper and photos are taken at the site of the road collision. Once collated with other information (see below), it is all entered into the OTS database.

3.155 The police are currently in the process of implementing an IT based system for collecting road collision data involving personal injury. The plan was that the project, known as CRASH, would be introduced in three police forces in early 2010 before being rolled out nationally across England and Wales. There have been some delays in the project as there is a debate about how the content of CRASH can be designed so that it meets the needs of: (a) the police

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[37] Note – the economic austerity measures being introduced in the UK involve cutbacks to many public services including the police. In response to this, at least one police force has been suggesting that it will "review the resource requirements associated with completing the STATS19 forms" with the clear implication being that it may cease this activity.

[38] http://www.highways.gov.uk/knowledge_compendium/473EE8D4CF1844B19ADC15DC91313C49.aspx

for criminal investigation purposes, and (b) to inform the national road collision statistics. The intention is that data is entered once only to meet both of these needs, rather than as two separate exercises.

3.156 The intention is that CRASH will:

- replace the collision reporting forms traditionally completed by police officers at the scene of an accident
- Improve the accuracy and speed with which road traffic collision data is gathered;
- provide more up-to-date information on collisions
- remove excessive paperwork.

3.157 The service will allow police officers to enter information either on a handheld computer or a vehicle data-terminal. It will link details entered at the scene directly to the Police National Computer, enable officers to make digital 'drawings' of collision scenes and automatically send information to the DfT.

Any known weaknesses in the data?

3.158 There has been known to be systematic variability in the quality of the STATS19 returns between police forces. For example some police forces never mark up more than two contributory factors for each road collision. This is inevitable as ‘standard’ practices will develop within each police force. There have been campaigns to address these inconsistencies through articles in the Police National Computer (PNC) magazine for example, but there is no specific organisation with responsibility for addressing this. There is also a feeling that the police sometimes do not take the data collection seriously enough.

3.159 The injury severities recorded by the police are not always accurate.

What is done with the data? (e.g. post processing, combination with other datasets)

3.160 The police submit their paper copies of the STATS19 forms to the relevant ‘back office’ function of the police station. This is normally staffed by civil administrators. At this level there can be translation errors. The data is then sent to the relevant Local Processing Authorities who might undertake some common sense checks on location information for example, but do not formally validate the records, before submitting the collated data to the DfT on an annual basis.

3.161 At Local Authority (LA) level, road collision data has historically been shared on a monthly basis in the Local Strategic Partnerships (a forum where LAs, Health Authorities, Social Services, fire and police services come together to discuss matters of shared community interest). Economic pressures across all these agencies mean that the Partnerships are no longer getting the support they once did.

3.162 The DfT hold the national road collision records. Management and verification of the records (e.g. location and numbers of fatalities, injuries etc) is outsourced by the DfT.

3.163 For the OTS data, scene investigators concentrate on gathering the details of the circumstances and causes of the accident. Subsequent to this, hospital and police records for the accident are obtained and analysed and a complete case report of each accident summarising the causes, circumstances and outcome prepared. The details of each case is coded and stored on a database.

3.164 In principle, the DfT are able to combine the STATS19 data with vehicle registration and driver registration data. We are not aware if this is routinely done but if it is done at all, it is not openly published.

Which organisation has formal responsibility for reporting national statistics?

3.165 The DfT are formally responsible for publishing the road safety statistics for Great Britain[39]. Local authorities and the Highways Agency publish data for their own road networks but these are sub-sets of the GB statistics.

Who analyses the data?

3.166 In practice it has been contractors to the HA who have undertaken the bulk of road collision data analysis. Analysis of the data is undertaken routinely by MACs to inform their quarterly Area Safety Reports. Historically, these have been used to identify 'hot spot' locations to inform short term and tactical safety investment planning. Over time however, the number of such locations have diminished and there is less need for such investments.

3.167 For specialist research studies, the HA will contract with specialist contractors such as: TRL; TSRC; Risk Solutions. This type of work is non-routine, bespoke and used to inform strategic imperatives or to address policy questions.

How is the data (or results from specific research) used to inform safety decision making?

3.168 The MACS have used local examination of road collision data to identify hot spots and have then made an application for funds to undertake the work. LAs undertake hot spot analysis also to prioritise short term road safety investments. In both cases the overall benefit cost ration (BCR) must be at least 1 before a scheme will be considered further. In the latter case, LAs are also required to demonstrate a First Year Rate of Return (FYRR), i.e. that the safety benefits associated with the scheme within the first year of operation, recover the costs associated with the scheme. With road safety performance levels where they are at the moment in the UK, this is increasingly difficult to realise.

3.169 Specialist studies of the national road safety data is undertaken typically to explore the impact of policy changes (e.g. research has been undertaken recently to explore the road safety risk of increasing the motorway speed limit to 80mph at certain locations), or to evaluate the implications of changes to strategy (e.g. switching off motorway lighting during certain hours of the night).

Examples of recent issues or campaigns?

3.170 Specific engineering interventions cited in the DfT strategy that are being considered for the Strategic Road Network include:

- Creating safer verges by the removal or protection of road side objects or creating 'softer verge environments' by changing metal posts to crash friendly posts that reduce the severity of an accident
- Vehicle separation marking (chevrons) schemes to discourage close following of other vehicles
- Central hatching to discourage speeding and overtaking.

3.171 Managed Motorways is the collective term being used by the HA to describe the roll-out of schemes that will permit hard shoulder running on motorways under certain flow conditions to alleviate congestion. These schemes rely on road users complying with speeds and lane closures as indicated on overhead gantry variable message signs (VMS). A recent research study was funded to look at compliance with lane closure VMS.

3.172 A research study (Existing Motorway Minimum Requirements (EMMR)) was recently undertaken to look at the safety risks associated with relaxing the departures applications process for existing motorways.

[39] http://www.dft.gov.uk/statistics/series/road-accidents-and-safety/

Funding of road improvement schemes

3.173 The current priority for road improvement schemes in Highways Agency is congestion relief and capacity development. The Managed Motorway programme is at the heart of this.

3.174 In principle, the Area teams can make proposals for safety improvement schemes. These bids will be collated and reviewed by the Central Programme Office and can attract funding. However, in the current economic climate, there is little appetite - nor perceived need - for engineering interventions for road safety improvement.

3.175 The Asset Management Office can allocate funds on a reactive basis following an incident or in response to a condition inspection.

4 ROAD COLLISION DATA COLLECTION IN IRELAND

4.1 For this part of the research we have undertaken:

- a review of the content of the road collision data forms (CT68/PC16 and LA16)
- a series of interviews with selected stakeholders from the Irish road safety community.

4.2 Interviews were held with the following individuals:

Name	Organisation / role	Location	Date
Theresa Durkin(*)	LA Area Engineer	Mayo	8-2-12
Nigel O'Neill	Head of Strategic Planning Unit NRA Strategic Planning	Dublin	9-2-12
Con O'Donohue	Superintendent Garda National Traffic Bureau	Dublin	9-2-12
Stephen Lambert	NRA Road Safety Engineer	Donegal	10-2-12
Jamie Gallagher	LA Area Engineer	Donegal	10-2-12
Lucy Curtis	NRA Road Safety Engineer	Kerry	15-2-12
Vincent Foley	LA risk management consultant	Kerry	15-2-12
Fiona Bohane	NRA Road Safety Engineer	Cork	15-2-12
John Coppinger	LA Senior Engineer	Kildare	16-2-12
Howard Johnson	Health Service Executive	Dublin	16-2-12
Michael Brosnan	Research manager Road Safety Authority	Dublin	17-2-12
Yaw Bimpeh	Statistician Road Safety Authority	Dublin	17-2-12

(*) Interviewed by telephone

Key organisations

Road Safety Authority

4.3 In 2006, the RSA (through the Road Safety Authority Act) took over statutory responsibility for road collision data collection from the NRA. The RSA have quite strong statutory powers for data collection under this Act, but these are not routinely wielded in the spirit of mutual cooperation and partnership.

An Garda Síochána

4.4 An Garda Síochána are responsible for filling out the CT68 / PC16[40] for road collisions involving a personal injury. This is the primary source of road collision data in Ireland and all the official road safety statistics are based on this.

National Roads Authority

4.5 The National Roads Authority (NRA) was formally established as an independent statutory body under the Roads Act, 1993 with effect from 1 January, 1994. The Authority's primary function, is to secure the provision of a safe and efficient network of National roads. For this

[40] The Garda tend to refer to the CT68 form as this is the original data entry form for road collisions in PULSE. PC16 is the updated terminology for the same thing and they are used interchangeably. We have tried to refer to this form consistently as the PC16.

purpose, it has overall responsibility for planning and supervision of construction and maintenance works on these roads.

4.6 All works on national roads (national primary roads (M roads and N roads up to N50) and national secondary roads (N roads from N51 to N87)) are funded by the NRA. The NRA will fund work on national roads that is managed by Local Authorities (LAs).

Road collision data collection in Ireland

4.7 There are two primary road collision data collection sources in Ireland:

1. An Garda Síochána
2. Local Authorities (LAs).

4.8 In addition to this, all acute hospitals in Ireland collect demographic, clinical and administrative data on discharges and deaths using the computer based Hospital In-Patient Enquiry Scheme (HIPE). This includes all acute hospital admissions as a result of road collisions and the nature of their injuries are recorded according to ICD-10-AM[41]. Whilst this is not a primary source of road collision data, the Health Service Executive is currently undertaking research into the severity of injuries attributed to road collisions.

4.9 We have looked at the level of detail that is contained in the PC16 and LA16 forms, the quality of the returns and the number of returns completed. The processes by which the data from these sources is collated are described below.

Road collision data collection and analysis

An Garda Síochána

Overview

4.10 The Gardaí are structured into ~26 Divisions – broadly at County level with some counties grouped and some urban areas (e.g. Dublin) split up. There are ~110 Districts below Division level. There are about 13,000 to 14,000 officers in the Garda, this includes approximately ~1,000 Traffic Corps across the whole country.

4.11 The Garda National Traffic Bureau (GNTB) was established in 1997 to formulate policy and oversee traffic policing throughout the state. It deals with policy issues, has no operational responsibility, and reports directly at Commissioner level. They deal with any public/press queries. There are 13 people in the Phoenix Park offices, 2 people dedicated to traffic data, collision, drink driving etc analysis to inform operational planning for enforcement. There are an additional 5 people who deal with safety camera enforcements, 60 more on general fixed charge processing.

Who is responsible for entering the data?

4.12 A Garda officer is called to all road collisions where someone has been injured. For material damage only road collisions, An Garda Síochána record a much reduced set of data.

4.13 At the scene, the officer calls in a report to the call centre in Castlebar, County Mayo, and goes through the Police Using Leading Systems Effectively (PULSE[42]) record fields for that

[41] ICD-10-AM is the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification. The ICD-10-AM disease component is based on the World Health Organisation (WHO) ICD-10. ICD-10-AM is used in conjunction with the Australian Classification of Health Interventions (ACHI) and the Australian Coding Standard (ACS) to reflect an accurate health episode of care. This classification was selected as the best international integrated coding scheme has been in use in Ireland since 1st January 2005 for all HIPE discharges.

[42] PULSE is An Garda Síochána incident log database which is used for all An Garda Síochána incident investigations. Road collision data is only one small part of the overall database which includes: names, addresses and other personal information. PULSE can be used to cross check individuals against previous criminal records.

type of incident. The call involves the data being entered by the call centre operators directly into PULSE with each field entry subject to some cross matching (e.g. names, addresses etc to look for evidence of already being recorded in the system). The call can take from 20 minutes for a minor collision up to 35-40 minutes for more serious incidents.

4.14 Within three days and once the officer returns to their desk at their local station, they are supposed to print off the PULSE record, add a sketch and narrative of the incident to the hard copy, get their sergeant to review it and then post this hard copy to the Road Safety Authority (RSA). In practice this step is often not completed as the officer may be at the end of a shift, may be off shift for a couple of days , and does not get round to completing the process. In those cases where it is done, the hard copy is scanned into the system by the RSA.

4.15 There are a substantial number of Garda stations in the rural communities that have no IT connectivity. In such cases the process is supposed to be that the Garda officer in the non IT station completes a paper copy which is then posted to the District HQ (of which there are ~108) where the completed form is transposed electronically into the PULSE system and hard copy posted to the Road Safety Authority (RSA).

4.16 The Garda officer therefore calls the initial information into the call centre and the call centre operator is responsible for transcribing this information into the PULSE database. The PULSE record should be validated by a Supervisor before the officer prints it off to add the sketch and narrative before sending the hard copy to the RSA.

What information is collected?

4.17 In Appendix 2 we compare and contrast the data collected by the Garda on the PC16 form with the road collision data collected in other countries.

4.18 In general, the level of detail in the PC16 road collision data forms is in line with best practice in other countries. Whilst there are certain parameters that could be refined or improved (and the plans to update the PC16 are summarised below), there is nothing obviously missing. The weakest area (also in line with most countries) is that the PC16 forms do not routinely provide much information about the causes of the road collision. Whilst sketches of the collision scenario can be very useful in this respect, this part of the form in not completed to a similar standard for all road collisions.

4.19 Data is collected for material damage collisions but this is a sub-set of the full PC16 form and limited to location and time type information.

In what form is it collected?

4.20 Originally, it was an entirely paper based system, before moving over to the PULSE system in 2001, and all paper copies were sent to the RSA. It is still the case that the Garda are only obliged to provide the paper copies.

4.21 Currently the data is collected by calling in a report to the PULSE call centre in Castlebar. A print off of this data is then sent to the RSA – along with a sketch of the road collision circumstances. The RSA should therefore receive a hard copy of each road collision report involving a personal injury.

4.22 For fatal collisions only, the Garda send the PC16 to the GNTB, who in turn send hard copies of the PC16 forms directly to the RSA.

4.23 Where PULSE records are not forwarded to the RSA, often this is down to the fact that the sketch has not been developed for attaching to the record. As indicated below, proposed changes to the PC16 should address this weakness and improve the percentage of returns to the RSA.

What is done with the data (e.g. post processing, combination with other datasets)?

4.24 The intention was that the PULSE data set for all road collisions (fatal, serious injury, minor injury and material damage) is sent to the RSA every quarter. In practice this has only been done on an annual basis.

4.25 The reports for all fatal and serious road collisions are then copied to the NRA and the relevant Local Authority, but only after they have been subject to an 'assurance' and data quality process by the RSA. This checking process typically addresses location information and eliminates inconsistencies within the record (e.g. a fatal road collision with 0 fatalities recorded). Unfortunately this means that there can be a considerable delay before the NRA gets access to the records (typically up to 18 months later, e.g. they are currently looking at data for 2010).

4.26 RSA do not send the material damage incident records to NRA because they are not subjected to the same quality assurance.

4.27 Scanned copies of the validated files are sent to the Local Government Computer Service Board (LGCSB) which has developed a system (MapInfo/MapRoad) to map road collisions onto a road map. All LAs pay a contribution towards funding of the LGCSB. In exchange for this contribution, any tools that the LGSB develop (e.g. MapInfo/MapRoad) are made available for LA use.

4.28 There is no reason why the data could not be provided to the RSA more frequently than at present, e.g. on a quarterly basis. Furthermore there is no technical reason why the data could not be provided to the NRA on the same timescales although it would need to be understood that this was for research purposes only and that the annual download will be the 'official' validated set. In the companion report, we recommended that un-validated data downloads from PULSE should be sent to NRA every six months, on the understanding that the 'official' dataset would still be provided by RSA some time later after the completion of their data validation checks. We also recommended that the dataset provided by RSA should contain the free text fields captured in PULSE that related to contributory factors in addition to the standard coded fields.

4.29 The National Traffic Bureau (NTB) undertakes its own analysis of road collision data to inform and target future enforcement campaigns such as drink driving or speeding. These analyses are undertaken entirely independently of the RSA, NRA and LAs.

How is the data used to inform safety decision making on highways infrastructure?

4.30 This is not a Garda responsibility but they are often asked to comment on proposed strategic intentions (e.g. increased enforcement). They are not routinely consulted on what they think should be undertaken.

4.31 The **Collision Prevention Programme (CPP)** is an initiative that was established for An Garda Síochána, the NRA and LAs to work in partnership with the purpose of:

"……proactively contributing to improving road safety; in a preventative approach to reduce the high number of road traffic collisions on Irish Roads."

4.32 The plans were that the CPP would realise this intent through engagement at local level. One of the benefits would be more timely access to local knowledge of road collisions (including material damage accidents) by sharing information through **District Traffic Safety Teams**. In practice, whilst there have been examples of good experience, the CPP has not been universally successful. This is primarily seen as resulting from a low level of engagement and commitment from all the relevant parties.

Proposed development of the PC16 form as part of PULSE

4.33 The PC16 form has been reviewed by a working group consisting of representatives from the Garda National Traffic Bureau (GNTB), the Garda Síochána Analysis Service (GSAS), the Road Safety Authority (RSA) and the National Roads Authority (NRA). As a result of this review there is a development proposal in the pipeline which is being considered by the relevant decision makers at the moment.

4.34 The main improvements that are being proposed are as follows:

- cross validation between fields in the form (inconsistencies is one of the main quality assurance checks undertaken by the RSA)
- Introduction of more drop down menus (to encourage consistent interpretation and interrogation)
- addition of a new field to cover journey purpose
- introduction of a set of pictograms (see Figure 7) which can be used to describe the road collision circumstances rather than having to revert to a sketch.

4.35 It is believed that this last point should result in a better rate of road collision report returns as it eliminates the need for a sketch to be included to the PC16 form – which is believed to be the main cause of non-returns. The set of pictograms agreed were developed jointly with road safety engineers in the NRA. They were judged to be comprehensive enough to ensure that the majority of road collisions could be captured in a sufficiently detailed and meaningful way. Whilst any pictogram selection can never provide as rich a picture as a sketch with supporting narrative, there will still be room for descriptive text and the improved rate of return that is expected is felt to outweigh the potential loss of road collision detail.

4.36 In addition to all this, the Gardaí are looking at provision of more accurate latitude and longitude location information via the GPS coordinates provided on the Tetra radios that are being gradually adopted by the Gardaí. There has been some reluctance by the Gardaí to adopt this technology wholeheartedly and the initiative is still being evaluated. We have not been able to determine if there is a target date for complete roll out.

Forensic reports on fatal road collisions

4.37 For all fatal road collisions, the Gardaí produce a forensic collision Investigation report. These are produced to support any prosecution case that may arise and the reports will go into a great deal of detail about the root causes of the road collision. To date this information has not been made available to the RSA or NRA and we have not been able to review any real files for our research. However, even though the numbers of such incidents are very small and there would be challenges in extracting statistically significant data from such reports, it is believed that the data held in the forensic reports would be a valuable addition to the pool of knowledge associated with road collision contributory factors. For this reason it is recommended that the NRA and the RSA investigate whether or not it might be possible for some of the forensic collision investigation report data to be made available (perhaps in a suitably anonymous form) for research purposes.

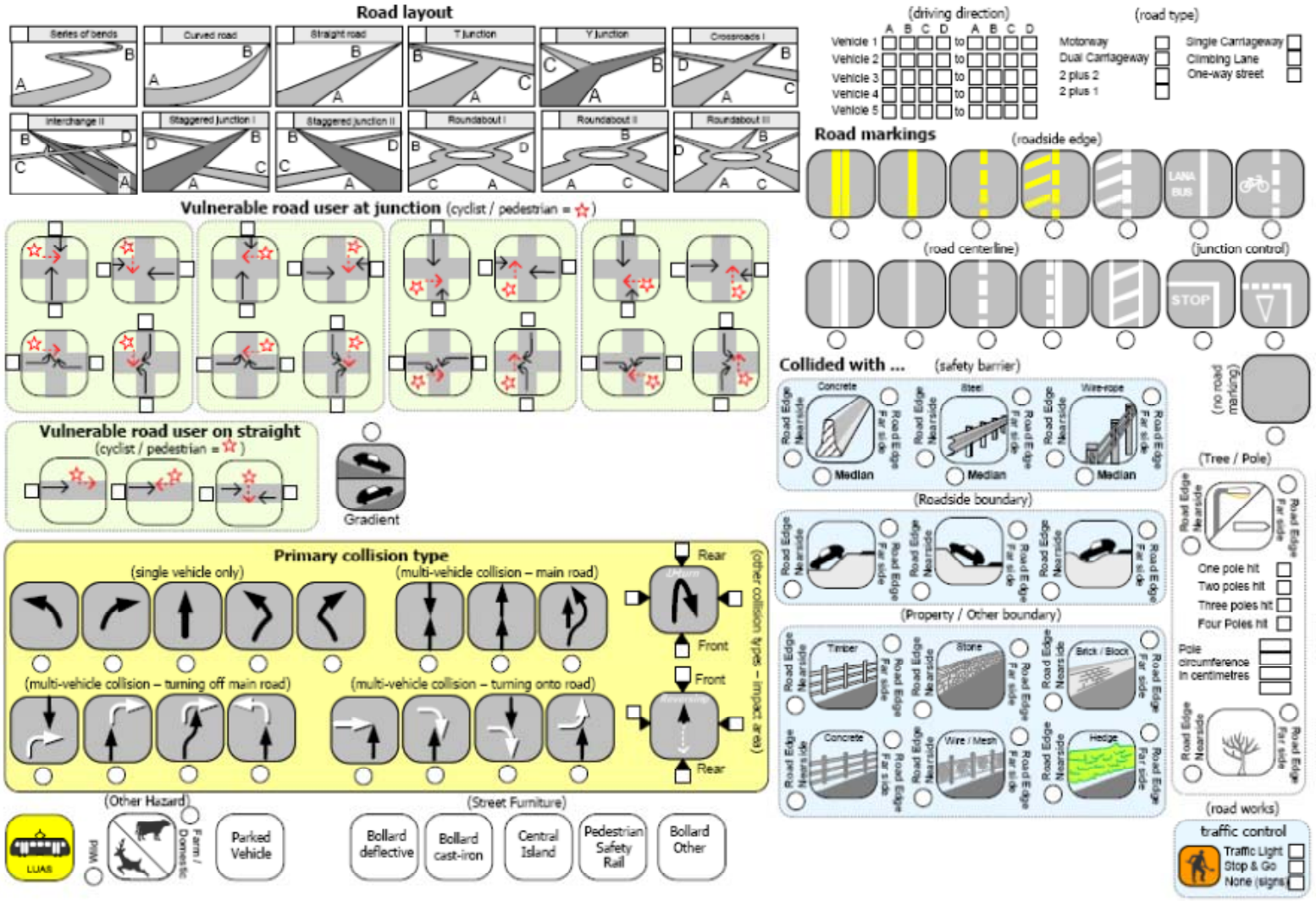


Figure 7 – Proposed icons to be included in revised PC16

Local Authorities

4.38 There are 34 Local Authorities in Ireland, termed county or city councils. In the 1990s the National Roads Authority took overall authority for national roads projects, supported by LAs who maintain the non-national roads system.

LA16

4.39 In recognition of the fact that the NRA have not been receiving road collision data in a timely manner, and that the PC16 forms do not routinely provide much information about the road collision scenario and root causes, the NRA developed a form (the LA16) for collecting road collision data for all fatal and serious[43] road collisions at Local Authority level. A pilot of the initiative was undertaken for 12 months in 2005 in Kilkenny. Following a review in 2006 it was decided to go ahead with the procedure and in October 2007 all LAs were asked to participate in the programme. Implementation of the process was included in the last road safety strategy by the Road Safety Authority (RSA). Following subsequent experience and feedback, it was reissued in 2009 as a modified PDF file to facilitate form completion.

The data collection process

4.40 Garda attend all reported road collisions. They should inform the LA about all serious road collisions (i.e. involving a serious or fatal injury) as described in the Garda Accident Traffic Collision policy / procedures. However, on the basis of our limited research, it would appear that this is not commonly understood and the step is not always adhered to. In those LAs where the Garda does not make this contact, the rate of return of LA16s to the NRA is practically non-existent. On the other hand, in those counties where LA16 returns to the NRA is extremely good, it is notable that good personal relationships at Garda District level have been established. So for example, in Kerry County, the name and contact details of the LA contact is posted at every Garda District station and it is routine to let the contact know when there has been a road collision involving a serious of fatal injury. To date this year, the overall returns have been at ~60%.

4.41 For serious road collisions, the call should go through to the Area Overseer who will communicate this to the Senior Engineer and thence to the LA Area Engineer. This process can take 1-2 hours. Occasionally if the Senior Engineer is proving difficult to contact, the chain bypasses them and the Area Overseer can contact the Area Engineer directly. Depending on the county, there can be several (up to 5) nominated individuals who have this responsibility.

4.42 The Area Engineer is then instructed to attend the incident scene but will not be able to access the site until the Garda have completed all their forensic investigations. Depending on the nature of the road collision, this can take several hours. Alternatively, the Area Engineer may elect to meet up with the Garda Investigating Officer after the event to discuss the road collision circumstances and potential contributory factors.

4.43 During the site visit, the LA16 is completed in consultation with the Garda Investigating Officer (or Investigating Team member if there was e.g. a shift change during the course of the investigation). The Investigating Officer (Team Member) may have already been formulating a hypothesis and may share this with the Area Engineer to ensure that the incident reports are consistent (note – this is without making assertions about the fault/cause of the collision, prior to any subsequent decision to prosecute).

[43] The LA16 form was developed to record data for all fatal and serious road collisions. In practice it has only been used for fatal road collisions.

What information is collected?

4.44 The LA 16 form has been designed to fit onto one side of A4 paper. It provides a visual check of the road environment only and is not intended to take the form of a detailed inspection. It captures information about the:

- location of the road collision
- severity of the collision
- type of road
- state of any road infrastructure in the vicinity

4.45 There is a narrative box where the road collision scenario is described following discussions between the Area Engineer and the Garda team member. In addition, various pictograms are used to inform the description of the road collision circumstances.

4.46 The Area Engineer will take photographs at the site and depending on the time since the collision, this may or may not include photos of the vehicles involved in the collision.

In what form is it collected?

4.47 Typically, an Area Engineer will take hard copies of the LA16 form with them to the site visit and complete it initially by hand. They then complete the PDF form electronically and attach any digital photos back at the office, before sending an electronic copy to the NRA.

What is done with the data (e.g. post processing, combination with other datasets)?

4.48 An electronic copy of the completed LA16 form and associated photographs is sent to the NRA and the senior engineer in charge. The overall process for managing the LA16 submissions is controlled by the NRA and they have issued guidance in support of this.

4.49 The LAs and the NRA combine the road collision location information with geospatial mapping systems to enable collision clusters to be identified. The Local Government Computer Sciences Board (LGCSB) have developed a system that maps road collision data onto a road map and this system is available to all LAs although they are under no obligation to use it.

4.50 The NRA imports the data from the LA16 returns and can map the location onto a suite of GIS type tools that they have available. The NRA undertakes more detailed analysis of the road collisions and will look over longer time scales to identify trends. In addition, the NRA is looking at combining road collision data with traffic volume data to inform an assessment of road safety risk as a function of vehicle kilometres travelled. The traffic volume data used in this process is manual traffic volume counts by LAs. Issues associated with the collection of traffic volume data are addressed in the companion report[44] to this one.

How is the data used to inform safety decision making on highways infrastructure?

4.51 At the Local Authority level, the Area Engineers may review their LA16 submissions and other PC16 returns once per year as input into next year's road safety plan and roads restoration programme. It is quite common at LA level that both of these are driven by last year's experience/events. Some of the Area Engineers we interviewed use MapRoad to inform their analysis but this does not appear to be universally true. Reasons why MapRoad is not used more widely should be explored with LAs.

4.52 The RSA road collision map on its web-site can be used by the LAs to provide a historical, geographical based picture of road collisions. Based on discussions with a limited number of LA Area Engineers, we do not believe that this system is widely used if at all, but we have not been able to confirm this.

4.53 Both the LAs and the NRA[45] tend to use collision cluster analysis to inform forward planning. The level of the analysis undertaken at LA level is relatively simple, tends to be driven by what

[44] Contributory factors analysis for road traffic collisions, Issue 2, Risk Solutions, November 2012

[45] The NRA has undertaken other types of analysis in the past, such as route treatments.

happened the previous year, and there is no common forum or mechanism for sharing information, identifying trends or exchanging and sharing ideas. There appears to be little contributory factors analysis done from the LA16 forms, either by the LA or by the NRA. This may be due to the difficulty of extracting contributory factors information from the current version of the form. In the companion contributory factors data analysis report we made some recommendations on how this could be improved; Local Authority engineers could use the LA16 form to express an opinion on whether road infrastructure related features were contributory factors to a 'Large Extent' or to 'Some Extent' in the same way that Garda officers do at present.

4.54 For national roads, the LAs will propose a programme of work to the NRA which is informed by safety risk cluster or hot spot identification. They can be helped in this respect by one of the six NRA funded Road Safety Engineers that are regionally based. However the funds available for these types of schemes are limited.

4.55 Most road improvements implemented by LAs are informed by material damage collisions rather than by road collisions involving injury. Types of work that is undertaken in this area would include taking away bends and curves. Data on material damage collisions is not routinely provided to the NRA or LAs. Information about material damage collisions can be provided by the Garda but this is on the basis of good personal relationships with Area Engineers as there is no obligation on the Garda to do so.

4.56 Road safety issues can get raised by the public (both directly and via councillors), Area Engineers and visual inspections. Overseers and Area Engineers should drive the area every week to identify areas of deterioration but it is not clear if this is a formal requirement in each LA, nor how well it is undertaken. Any works generated via this route is always of a reactive rather proactive nature and can be divorced from any analysis of road collision data.

LA issues

4.57 There are six NRA sponsored Road Safety Engineers who are located across Ireland and who have responsibility for providing guidance to Local Authorities about work on national roads as the NRA will fund work on national roads that is managed by LAs.

4.58 However, the amount of these funds can be relatively small (e.g. in Kildare in 2011-12 this was of the order of €150k - €200k which compares with an overall budget for non-national roads which is in the range of €20m - €30m). We presume that this picture is similar in other LAs and in such circumstances there are competing pressures on relatively scarce resources and releasing engineers to support NRA work, including completion of LA16 forms, may not be given high priority.

Health Service Executive

4.59 The Health Services Unit of the Health Service Executive has been developing their ATLAS system to include road collision information for health epidemiology purposes. The COLLSTATS part of ATLAS contains road collision location, gender and age of the affected individuals and can be viewed on the RSA's web-site.

4.60 Current activities include cross matching this data with the Hospital In-Patient Entry (HIPE) data. This current research is aimed at evaluating the range and severity of road collision injuries to inform a revised injury severity index. There is no attempt to cross check HIPE road collision numbers with those reported by the Garda.

Quality of the returns and number completed

4.61 In 2009 there were about 6,600 Garda reported road collisions where someone was injured. For all road collisions where an injury has been sustained by someone, the PC16 forms should be returned to the Road Safety Authority (RSA). However, significant numbers (20-30% at any given time) are not returned. This is generally blamed on the fact that the PC16 requires an incident sketch and associated road collision narrative to be included on the form. Often, the Garda officers do not get round to this.

4.62 For those forms that are sent to the RSA, considerable effort is expended in assuring the quality of the reports. The most prevalent problems are:

- completed fields on the PC16 forms are inconsistent
- road collision location information is wrong or poor.

4.63 As a result of the steps necessary to ensure the quality of these records, it can take the RSA 18 months after receipt of the CT68 records to release them to the National Roads Authority (NRA) and the relevant Local Authority (LA).

4.64 In order to ensure more timely access to fatal and serious road collision data, the NRA, in partnership with LAs and An Gardaí, introduced the LA16 form. This is completed by LA Area Engineers in consultation with the Garda, and returned to the NRA in electronic form. In principle these should be completed for all road collisions involving a serious or fatal injury. In practice, for resource constraint reasons, the process tends to be limited to fatal road collisions only.

4.65 In some LAs the rate of return for LA16s is very good (e.g. Kerry), in others (e.g. Kildare) it is very poor. This is attributed to the following reasons:

- enthusiasm and perceived value of the process at LA level
- willingness to release competent resources to support the process
- establishment of good relationships at District level between the LA and the Garda.

5 SUMMARY OF ROAD COLLISION DATA COLLECTION AND ANALYSIS

There is an increased move towards electronic, on-site capture of road collision data.

5.1 Most police forces collect road collision data on paper. Widely held views about the weaknesses in police records are that:

- they can contain errors (e.g. location information and inconsistencies between data fields)
- they are weak in capturing injury severity information
- they do not capture enough contributory factor data.

5.2 In some countries (e.g. Germany and Sweden) collection of data 'on-site' using PDA type devices has been on-going for some time. In both Hungary and the UK they are about to implement a national scheme for 'on-site' collection of road collision data using systems that will upload the data directly to their national databases. This move towards immediate capture of road collision data 'on-site' will address many of the perceived weaknesses in the current paper based schemes.

5.3 In Ireland, the roll-out of the Tetra radios to the Garda should ensure that more accurate location information can be provided on the PC16 forms. It is not clear what the timetable for this roll-out is, but it should be progressed as a matter of high priority.

Several countries have commissioned special road accident investigation teams.

5.4 In recognition of the fact that the police records do not capture root cause and contributory information, Germany, Norway, Sweden and the UK have established specialist teams for this purpose. Germany and the UK outsource this activity, Norway and Sweden use internal resources for it.

5.5 A lot of the information captured by these specialist investigation teams is of a personal and confidential nature so it does not get openly published.

5.6 The costs and resources necessary to support these initiatives are not readily available. We understand that the size of the investigation teams in the Scandinavian countries are about 5 or 6 people but it is not clear what proportion of their time is spent on collision investigations. In Germany the road collision investigation team consists of four people who operate in shifts. In the UK, the 'on the spot' (OTS) road collision data collection initiative will cost ~ €1m per year.

5.7 Ireland's LA16 form is a step in this direction but the level of detail captured in it is much less than the accident investigation teams capture. We believe that the LA Engineer and the Garda who visit the road collision site should be encouraged to discuss and consider possible road collision contributory factors and that the LA engineer should record these thoughts on the LA16 form without feeling that this needs to be a definitive root cause of the road collision. This would be a valuable addition to the LA16 form as it stands.

Most countries are linking road collision data to other databases for analysis purposes.

5.8 Most countries are linking road collision data to geospatial or GIS based systems for mapping purposes. In several cases (e.g. Germany, Hungary, UK), the data is also being linked to road asset registers. This enables certain road attributes recorded in the police records to be checked and verified and, in principle, can reduce the number of data fields that need to be recorded by the police at the site of the incident.

5.9 In the Netherlands and Sweden, the road collisions data is being linked to medical records to improve the injury severity data and also to capture non motorised vehicle (e.g. cyclist) road collision data.

5.10 Most countries recognise that there would be advantages in being able to link the road collision data to vehicle registration data as well as driver licensing data. This has been undertaken in the Netherlands but in most countries, residual concerns about data confidentiality mean that this is not being openly progressed.

5.11 In Ireland, the Health Service Executive has been mapping road collision data to demographic geographical data for epidemiological analysis purposes. Whilst in principle this data could be made available for more widespread analysis purposes, in practice there are data protection issues that will constrain the willingness to do this without Ministerial or Government support.

5.12 Through the PULSE system, the Garda have the ability to cross reference road collision data with driver licence information but this is not made available outside the Garda. Again, sharing of this information will not happen in the current data protection environment.

The national roads authorities in most countries develop analysis tools that can be used by Local Authorities to inform their road safety investment needs and priorities.

5.13 In almost every country we considered, the national road authority takes the lead in developing road collision analysis tools and publishing road collision data in a form that can be used by researchers and local authorities to inform road safety decisions and strategies. The teams responsible for this are in effect ‘centres of excellence’ in their country.

5.14 In Ireland, LAs have access to MapInfo/MapRoad which maps road collision data onto a road map. In principle they also have access to the HSE ATLAS data on road collisions that is on the NSA web-site. It is not at all clear how widely these tools are used by LAs, the NRA should investigate reasons for resistance to use of these tools and the potential benefits of introducing a new Geospatial model of road collisions.

6 COMPARISON OF CONTENT OF ROAD COLLISION DATA

6.1 In this section we compare the content of the road collision data collection forms in other countries with that of Ireland. The countries included in this aspect of the benchmarking exercise were driven by what we could get access to from available literature and included:

- United Kingdom (UK)
- Ireland (IRE)
- Netherlands (NL)
- Hungary (HU)
- Italy (IT)
- Germany (DE)
- Spain (ES)
- Lithuania (LT)
- Malta (MT)
- *EU (CADaS)(*)*
- *USA (FARS)(*)*
- *Netherlands augmented (NL+)(*)*

(*) these are special cases which were included in the analysis for reasons described below.

Method for comparing data collected

6.2 Our aim here was to provide a reasonable basis for comparison of the breadth and content of road collision data collected in each country, commensurate with the resources and time available.

6.3 For most of the countries studied, the starting points were raw materials gathered for the European SafetyNet project[46] - primarily:

- **sn_ntua_1_4_final report_Appendix I** : which shows road collision data records collected in the participating countries (we looked at those presented in English only)
- **sn_ntua_1_4_final report_Appendix II** : which provides additional information in the form of national responses to questionnaires.

6.4 In starting from these sources we were fully aware that they were generated circa 2005 and hence subject to possible changes since that time. Also, some of the data records presented were the basic police road collision data collection forms, some were a synthesis of the data records from the resulting database.

6.5 Where possible we supplemented our analysis or updated it, using

- other public domain sources
- information available to us from our own experience (for example, for UK STATS19)
- further information submitted by contacts in the relevant country or amendments where we were able to get them to respond to our initial draft.

6.6 We synthesised our findings in a set of comparison tables developed in a Microsoft Excel framework. These tables were derived in an iterative process that is described below but is structured under five primary headings:

1. Incident Reference Information
2. Circumstances
3. Vehicles
4. People
5. Contributory Factors

[46] http://erso.swov.nl/safetynet/content/wp_1_care_accident_data.htm

Developing the data comparison framework

6.7 The starting point was to draw up a list of road collision data fields that are used in one country. This initial list was then compared, one country at a time and where the same fields were recorded, this was noted. Where a new data item was identified that was not in the initial list, this was added to the generic list (noting where it came from) and this revised generic list then became the basis for comparing the data fields collected by the subsequent countries considered.

6.8 Our starting point in developing the data comparison framework was the STATS19 data field used by the UK police force. This was selected as the starting point as we are very familiar with the STATS19 structure and we know that it is pretty comprehensive. One of the difficulties in this 'pairwise' comparison is that different countries can use slightly different terms to mean the same thing. We addressed this by deriving generic data field headings and assigning them to be equivalent between different countries if, in our judgement, the intent seemed the same, even if the specific detail or options within each data field were slightly different. Judgements were made about equivalent fields where the overall intent seemed to be the same although the content may spread across different data fields. Where a close but not exact equivalence was judged we either revised the generic description of the data field or added it as a new data field in the overall generic list.

6.9 Three special cases were also included in the data comparison framework to give wider insights:

1. **EU CADaS**[47] – the Common Accident Dataset (which links into the CARE project seeking to get a harmonised data for analysis across the EU area)
2. **USA – FARS**[48]- fatal accident recording system, which does more complete investigation for road fataltites in USA – included here both for a USA perspective but also to illustrate the sorts of fields added by such investigation.
3. **NL+**[49]. Netherlands is an example of where the primary data collected at the scene is already being augmented by data from linked databases, such as vehicle details. We had input for this from contacts in NL who not only helped to ensure the NL "base" information we had was fully up to date, but also confirmed the additional data from such links.

6.10 As the data comparison framework was developed and expanded, we developed summary tables at two levels:

1. Coverage of the generic data field list
2. Summary of general coverage.

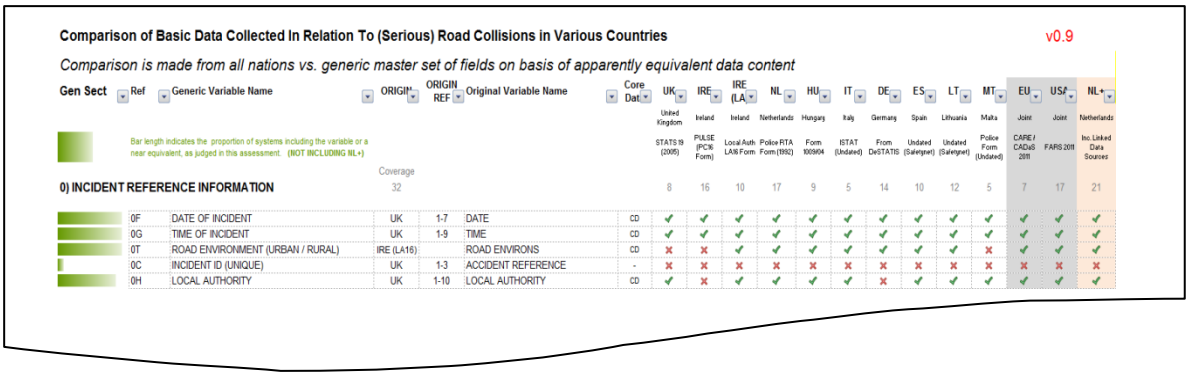
Coverage of generic data field list

6.11 This is a single chart simply noting whether or not a "match" was recorded in the comparison, giving a chart in the form shown in Figure 8.

47 http://ec.europa.eu/transport/wcm/road_safety/erso/safetynet/fixed/WP1/D1.14%20CADaS_The%20Common%20Accident%20Data%20Set_Final%20report_2.pdf

48 http://www-fars.nhtsa.dot.gov/Main/index.aspx

49 Private communication, P Mak, safety adviser, Netherlands Ministry of Infrastructure and the Environment.



Comparison of Basic Data Collected In Relation To (Serious) Road Collisions in Various Countries v0.9

Comparison is made from all nations vs. generic master set of fields on basis of apparently equivalent data content

Gen Sect	Ref	Generic Variable Name	ORIGIN	ORIGIN REF	Original Variable Name	Core Dat	UK United Kingdom STATS 19 (2005)	IRE Ireland PULSE (PC16 Form)	IRE (LA) Ireland Local Auth LA16 Form	NL Netherlands Police RTA Form (1992)	HU Hungary Form 1009/04	IT Italy ISTAT (Undated)	DE Germany From DeSTATIS	ES Spain Undated (Safetynet)	LT Lithuania Undated (Safetynet)	MT Malta Police Form (Undated)	EU Joint CARE / CADaS 2011	USA Joint FARS 2011	NL+ Netherlands Inc. Linked Data Sources
Bar length indicates the proportion of systems including the variable or a near equivalent, as judged in this assessment. (NOT INCLUDING NL+)																			
			Coverage																
0) INCIDENT REFERENCE INFORMATION			32				8	16	10	17	9	5	14	10	12	5	7	17	21
	0F	DATE OF INCIDENT	UK	1-7	DATE	CD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	0G	TIME OF INCIDENT	UK	1-9	TIME	CD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	0T	ROAD ENVIRONMENT (URBAN / RURAL)	IRE (LA16)		ROAD ENVIRONS	CD	✗	✗	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓
	0C	INCIDENT ID (UNIQUE)	UK	1-3	ACCIDENT REFERENCE	-	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	0H	LOCAL AUTHORITY	UK	1-10	LOCAL AUTHORITY	CD	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓

Figure 8 – Excerpt from generic data field comparator

6.12 The 'ORIGIN' column indicates where the generic variable name or data field was sourced from as the comparison framework evolved. This information changes as the table develops to show the additional fields added beyond UK STATS19.

6.13 The shaded bars in column 1 on the left give a very quick visual relative measure of the number of countries where the data field is covered. **The full table is shown in Appendix 2.**

Summary of general coverage

6.14 This table aggregates the data fields under each of the general headings and provides a count of the number of generic data fields under that heading that are covered by each country. This is presented in a simple chart as shown in Figure 9.

Comparison of Basic Data Collected In Relation To (Serious) Road Collisions in Various Countries v1.0

Comparison Summary Showing Coverage (number of matched fields) covered by each nation / dataset

Core Data Filter Status: Off (CD Filter removes a list of "reference" information from the comparison) — Special Cases

	Generic Master List	UK United Kingdom	IRE Ireland	IRE (LA) Ireland	NL Netherlands	HU Hungary	IT Italy	DE Germany	ES Spain	LT Lithuania	MT Malta	EU Joint	USA Joint	NL+ Netherlands
GENERIC SECTION	Total	STATS 19 (2005)	PULSE (PC16 Form)	Local Auth LA16 Form	Police RTA Form (1992)	Form 1009/04	ISTAT (Undated)	From DeSTATIS	Undated (Safetynet)	Undated (Safetynet)	Police Form (Undated)	CARE / CADaS 2011	FARS 2011	Inc. Linked Data Sources
0) INCIDENT REFERENCE INFORMATION	32	10	17	11	19	10	8	16	11	13	6	8	18	23
1) CIRCUMSTANCES	36	16	15	13	17	16	9	13	19	9	10	16	15	29
2) VEHICLES	84	25	41	8	33	19	25	24	29	15	16	20	59	61
3) PEOPLE	49	18	26	3	33	17	13	8	8	15	12	14	22	36
4) CONTRIBUTORY FACTORS	23	15	12	1	2	3	2	3	8	3	2	2	17	3
TOTAL GENERIC FACTORS COVERED	224	84	111	36	104	65	57	64	75	55	46	60	131	152
% GENERIC FACTORS COVERED	100%	38%	50%	16%	46%	29%	25%	29%	33%	25%	21%	27%	58%	68%

Figure 9 – Summary of numbers of data fields captured by each country

6.15 At the time of writing, the comparison had identified 224 generic data fields across the 10 countries and 2 international datasets studied.

6.16 Note that the column labelled **'NL+'** shows how the coverage can be increased by linking the police road collision data with other databases. In this case the police records under column **'NL'**address 46% of the generic data fields, linking it with other databases – as described in Section 3 – increases this to 68%.

Interpretation of the data comparison framework

6.17 The data comparison framework should be interpreted with some understanding of the sources used to populate it, and the process from which it was generated. We provide the following text to highlight important aspects of this.

Sources

6.18 The sources for each national system are noted at the top of the comparison tables. As noted earlier, many are from the 2004/5 SAFETYNET Project documentation and in a few cases their original sources are even older (e.g. NL 1992 form). However, where possible, the field list was checked or updated based on our interviews / emails with contacts in each of the benchmark countries.

6.19 Note also that whilst the United Kingdom (UK), Ireland (IRE), Netherlands (NL) and Hungary (HU) sources are Police Accident Reports, the IRE LA16 is based on the Local Authority/NRA road collision report for fatal road collisions. The Common Accident Data Set (CADaS)[50] is a proposed development of the data fields collected for the European community CARE[51] database for road accidents involving personal injury. The USA FARS[52] is a National Highway Traffic Safety Administration (NHTSA) dataset based on police reports, but with additional interpretation and coding[53].

Matching and number of fields

6.20 The matching of fields has been done 'by eye' based on the variable name and, where available, the options/codes. A full user guide to the data field meanings was only available for STATS19 and FARS (USA). Note also that the numbers of generic fields covered can only be a rough indicator of the depth of coverage due to the different data structures. For example a database like PULSE lists every element of personal details in individual fields (so adding to the total), whereas another source might simply have 'Address' and 'Phone'. To make a true comparison, the generic fields would need to be rationalised and given importance weightings (see later discussion).

Equivalence

6.21 In many cases, the data fields overlap and so the equivalence is not exact. A good example is in the various descriptions of road layouts and junctions. The presence of a roundabout may be noted as part of a **JUNCTION DETAIL** in one system, but as part of the **ROAD LAYOUT** in another.

Purpose and completion criteria

6.22 The purpose of the data collection form and the criteria for it being completed vary and influence the presence of certain fields. Ireland uses the same form for road accidents as for other potential criminal investigations. Similarly, STATS19 only records incidents where at least one injury occurs and the focus is on the casualties and accident causes. Other sources have a wider use and may record all persons involved, whether or not they were injured.

Personal data

6.23 Some forms contain the complete police incident record, whereas others only the data required for input to the national road collisions database. Hence personal data may appear or may not. In the latter case being redacted before being sent from the police to the national road collision statistics organisation. The presence of large number of such fields in some datasets inflates the number of generic data fields and may distort the overview. We discuss this further below.

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50 SafetyNet, CADaS, Common Accident Data Set. Recommendation for a Common Accident Data set, Reference Guide, Version 2.0, October 2008.

51 http://ec.europa.eu/transport/road_safety/specialist/statistics/care_reports_graphics/index_en.htm

52 http://www.nhtsa.gov/FARS

53 FARS covers all Fatal Accidents - in USA the Police Accident Report (PAR) format is defined at state or even county level and differs between localities

Contributory factors

6.24 The top level summary suggests that there is a lack of contributory factor information in the NL and HU data maps analysed. However, this may reflect the age of the sources we used for this exercise. CADaS does not have a major section on contributory factors. We understand that there is emerging work in this area but we have not been able to consider this for this exercise.

Data from other national sources

6.25 Some of the data systems contain many fields relating to (a) Vehicle Data and/or (b) Driver Information. All these fields could be removed if a link were established to (a) the national vehicle registration database and (b) the national driver licensing database. The presence of a large number of these fields - currently gathered 'by hand' - emphasises the major gains being sought be several EU countries (and USA) of linking such national data sources so that all the attending police officer has to enter is the vehicle registration number (or vehicle identification number (VIN)) and the driver license number(s). Section 3 highlights those countries we benchmarked where such thinking is being progressed.

Personal data

6.26 The national approaches to collecting road collision data vary significantly in how they handle personal data. Some consider all persons in the same way and group them in a **PEOPLE** or **CASUALTIES** section (e.g. CADaS). Others (including STATS19) split the data, so the detail of a person's relationship to any involved vehicle is included with the VEHICLE data, whereas their injuries are recorded against them individually as a CASUALTY. Still others put the DRIVER information including driver injury in VEHICLE data, and PASSENGER/PEDESTRIAN injuries in their own area. These are conceptually different approaches and the data in the PC16 form is difficult to categorise as one or the other, since it has less a less distinct section structure. Testing for alcohol is a good example: in the UK STATS19 form this is covered as a VEHICLE (driver) related data item; in others (e.g. CADaS) it is in the PERSONS section.

Police data and post processed / augmented data

6.27 A database which contains solely the data collected by the police at site (e.g. STATS19) may contain less than one which is held and managed by a roads authority. In the latter case the database may be augment the police data through linking to other data sources (e.g. driver information, vehicle information), or by interpretation of police narrative to generate additional data fields. The USA FARS database is the latter, codifying data from diverse PAR (Police Accident Report) designs across states, for all fatal accidents. This is part of the reason why it has so many more fields.

6.28 Note – whilst we have had access to the 500 page USA FARS coding manual, we cannot claim to have examined every element of the coding. It is possible therefore that we have understated the numbers of data fields included in the FARS system as we have not delved deep enough into the selection lists.

Availability of form guidance

6.29 In some cases (e.g. Lithuania) much of the information needed to interpret or complete the police road collision data collection form is in a separate Annex (referenced but not available publicly) which makes the equivalence matching subject to some interpretation. This is in contrast to the PC16 forms and others, where the form itself contains more information. There is no right or wrong approach. Minimal guidance will be needed if the form is filled in by specialists in a central or back office. In this case they can use a 'basic' form with separate guide notes, in addition to which familiarity means they can learn the codes. A form for completion at the roadside by police officers who undertake diverse duties cannot depend on that familiarity, and more guidance may be necessary to ensure consistency.

Core data comparison

6.30 A number of the data fields in the comparison framework could be argued as being inappropriate, in the sense that they appear as a result of

- the way the data is structured (such as the way the IDs relate record elements)
- the nature of the source, rather than from real difference is in the core data contained in each national system
- they relate to information the police might gather, but is unlikely to be related to the use of the data to assess the safety aspects or causes of road collisions (such as vehicle colour) OR would be available in other countries, via a link to other databases.

6.31 In order to see whether this is affecting the overall impression given in the comparison totals, the tables in the comparison framework can be revised to exclude a number of these fields. The selection of what to exclude is of course itself a judgement, but we chose to strip out the following fields, just to generate a “core data” perspective.

0) INCIDENT REFERENCE INFORMATION

0A	RECORD TYPE (NEW/UPDATE)
0C	INCIDENT ID (UNIQUE)
0AB	REPORTING ORGANISATION
0AC	COORDINATING ORGANISATION

2) VEHICLES

2A	RECORD TYPE (NEW/UPDATE)
2A	POLICE FORCE
2B	INCIDENT ID (UNIQUE)
2C	VEHICLE ID (UNIQUE WITHIN INCIDENT ID)
2T	DFT SPECIAL PROJECTS
2AA	VEH COLOUR
2AD	VEH VIN / CHASSIS No.
2AE	VEH VALUE
2AF	VEH DESCRIPTION / BODY TYPE
2AG	VEH ENG TYPE
2AH	VEH ENG NO
2AI	VEH ENG SIZE

3) PEOPLE

3A	RECORD TYPE (NEW/UPDATE)
3A	POLICE FORCE
3B	INCIDENT ID (UNIQUE)
3C	VEHICLE ID (UNIQUE WITHIN INCIDENT ID)
3D	PERSON ID (UNIQUE WITHIN INCIDENT ID)
3S	SURNAME
3T	FORENAME
3U	MOTHERS NAME
3V	NICKNAME
3X	HOME TEL
3Y	WORK TEL
3Z	MOBILE TEL
3AA	FAX
3AB	EMAIL

4) CONTRIBUTORY FACTORS

4S	SUPERVISOR'S DECISION ON RECOMMENDATIONS (Narrative)
4T	INVESTIGATING OFFICER SIGN-OFF AND ID
4U	SUPERVISING OFFIVER SIGN-OFF AND ID

6.32 With these fields excluded (Core Data Filter set to "ON"), the summary table looks like this.

Comparison of Basic Data Collected In Relation To (Serious) Road Collisions in Various Countries v1.0

Comparison Summary Showing Coverage (number of matched fields) covered by each nation / dataset

Core Data Filter Status: On (CD Filter removes a list of "reference" information from the comparison)

Special Cases

	Generic Master List	UK	IRE	IRE (LA)	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
		United Kingdom	Ireland	Ireland	Netherlands	Hungary	Italy	Germany	Spain	Lithuania	Malta	Joint	Joint	Netherlands
GENERIC SECTION	Total	STATS 19 (2005)	PULSE (PC16 Form)	Local Auth LA16 Form	Police RTA Form (1992)	Form 1009/04	ISTAT (Undated)	From DeSTATIS	Undated (Safetynet)	Undated (Safetynet)	Police Form (Undated)	CARE / CADaS 2011	FARS 2011	Inc. Linked Data Sources
0) INCIDENT REFERENCE INFORMATION	32	8	16	10	17	9	5	14	10	12	5	7	17	21
1) CIRCUMSTANCES	36	16	15	13	17	16	9	13	19	9	10	16	15	29
2) VEHICLES	84	20	30	5	30	16	22	22	25	10	13	16	53	52
3) PEOPLE	49	13	13		20	14	9	8	8	9	8	11	18	23
4) CONTRIBUTORY FACTORS	23	14	8		1	1	2	3	8	1	2	2	17	2
TOTAL GENERIC FACTORS COVERED	224	71	82	28	85	56	47	60	70	41	38	52	120	127
% GENERIC FACTORS COVERED	100%	32%	37%	13%	38%	25%	21%	27%	31%	18%	17%	23%	54%	57%

6.33 For ease of comparison, the totals in the unfiltered table, are as follows:

TOTAL GENERIC FACTORS COVERED	224	84	111	36	104	65	57	64	75	55	46	60	131	152
% GENERIC FACTORS COVERED	100%	38%	50%	16%	46%	29%	25%	29%	33%	25%	21%	27%	58%	68%

6.34 We discuss our observations from the comparison framework in the following section.

Observations from the data comparison framework

6.35 The summary tables from the data comparison framework give a reasonable 'first impression' of where major differences may exist between the different countries.

6.36 Where we have made an observation on the summary numbers of data fields covered, we have used the filtered 'Core Data' table as the basis for the comparison as we think this is more meaningful.

6.37 A distinction is drawn between the individual national examples (UK, IRE, NL, IT etc) and the special cases of the EU CADaS dataset (which is transnational) , the USA FARS data (which is included as an example of specialist investigation, for fatalities) and the NL+ dataset, which includes the directly collected police data and then data derived from linked data sources.

6.38 Contributory factors are still an emerging element of data collection and not covered as a specific focus in all countries. We are aware of a pan-European project to increase this focus and to create a summary 'causation' database to complement the CARE road accidents database. This suggests that causal factors will become a standard part of national data collection in the future.

6.39 In the benchmark countries that we looked at, Ireland's PC16 and UK's STATS19 datasets, alongside that from the Netherlands, are amongst the most comprehensive examples in terms of contributory factors information. The number of contributory factors in the UK STATS19 data was increased during a major upgrade in 2005. For Ireland the number of contributory factor fields is comparable to UK and it is stronger than most. Spain's system does cover many of the factors, but only based on a couple of quite generic fields. Overall, this is consistent with the suggestion that as other countries update their approaches in the near future, we can expect to see more contributory factors included.

6.40 It is encouraging to note how well the newer EU members/ ex-eastern block countries represented align with the longer standing members, across the range of data fields. In the case of Hungary, we know this is reflective of a strategic decision to improve their approach which was accompanied by specific legislation including penalties for certain offences (e.g. alcohol limits for driving) in 2009.

6.41 There is a definite move away from dependence on narrative fields towards use of codified data collection, although the narrative element also remains. This is being driven largely by the increased utilisation of mobile digital data collection tools.

6.42 The data collected in Ireland covers at least 36 of the 52 data fields in the EU Common Accident Dataset (CADaS) which compares with 26 in the UK, and 37 in NL. We would anticipate that with some additional 'rule based' mapping of the existing dataset, most of the CADaS data is probably available.

6.43 The NL+ list of fields was added to illustrate how a base dataset has been enriched through linkage to other national systems – an approach being favoured by many countries. Although this can require national action to permit data exchange within appropriate data protection constraints, examples from NL+ are given in the sections that follow, perhaps suggesting how such automated linking may free up police reporting time to focus more on assessment of contributory factors.

6.44 The USA FARS (Fatalities only) system is not discussed in great detail here, but was included as an interesting illustration of the sort of additional fields gathered in such a specialist investigation system.

Assesment of detail in Ireland's road collision data fields

6.45 It is worth noting the high level conclusion that the road collision data collected in Ireland is comparable with the best in the group of nations in our sample, in terms of its depth and breadth of coverage.

6.46 The analysis described in this section is based on a more detailed assessment of the specific data fields collected. We are interested in determining whether or not there are additional road collision data fields which Ireland might consider including in the future. Alternatively are there any data fields that are redundant and which could be dropped. The intention is to provide a basis for thoughtful discussion within the NRA.

6.47 With more resources, the NRA could of course now conduct a line by line analysis of every generic data field we have found from all the comparator systems we have reviewed to assess whether or not it would be valuable to collect that data. However, to focus the discussion on a more manageable number of items, we have filtered the table down in three ways to provide a basis for this discussion:

A – Possible Additions, i.e. what do some others collect that is not covered by the PC16?

B – Possible Reductions, i.e. what is included in the PC16 which others do not collect?

C – Comparison with CADaS, i.e. how much of the CADaS data field list is already covered by the PC16?

6.48 In analyses A and B, we present the filtered set of generic data items in the following text, and make some observations for each of the 5 general comparison framework headings. The specific 'filter criteria' that we used for these analyses are given at the top of each analysis. Analysis C is a simple comparison of the overall coverage of the PC16 in comparison to the generic CADaS list.

Notes

6.49 The 'others' counted in filtering the list refers only to the other national datasets, not the three special cases (EU CADas, FARS and NL+). The difference of these special cases is brought out within the discussion where relevant.

6.50 Where a field is noted as 'X' (i.e. no match) it does necessarily mean there is no similar field in the relevant national dataset. In many cases this has marked to show that although there is a field is closely related to another one, there is a sufficient difference in emphasis or scope to warrant highlighting it as a separate generic field.

6.51 We have not commented on every single field that appears in the filtered tables. We have concentrated on those where we had a clear observation to make.

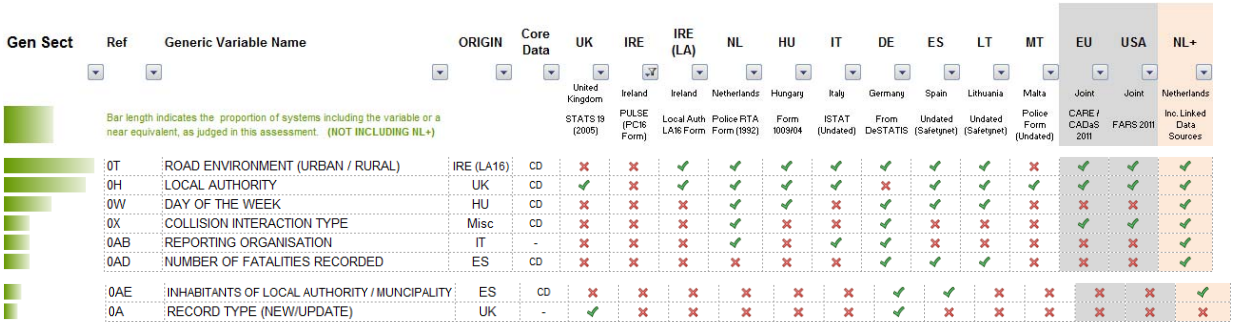
6.52 The filtered tables were arranged in descending order of data field ‘count’ across the sample of nations, in order to support the analysis. Some fields are grouped under a single comment, in which case the ordering has been modified to bring the items together.

6.53 Since the focus of this work is contributory factors, we looked at these without any filtering of the data tables.

A: Possible Additions

Filter Criteria: *IRE = X (not directly) collected* ***And*** *2 or more other national datasets include the field*

(0) INCIDENT REFERENCE INFORMATION



Gen Sect	Ref	Generic Variable Name	ORIGIN	Core Data	UK	IRE	IRE (LA)	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
					United Kingdom	Ireland	Ireland	Netherlands	Hungary	Italy	Germany	Spain	Lithuania	Malta	Joint	Joint	Netherlands
	Bar length indicates the proportion of systems including the variable or a near equivalent, as judged in this assessment. (NOT INCLUDING NL+)				STATS 19 (2005)	PULSE (PC16 Form)	Local Auth LA16 Form	Police RTA Form (1992)	Form 1009/04	ISTAT (Undated)	From DeSTATIS	Undated (Safetynet)	Undated (Safetynet)	Police Form (Undated)	CARE / CADaS 2011	FARS 2011	Inc. Linked Data Sources
	0T	ROAD ENVIRONMENT (URBAN / RURAL)	IRE (LA16)	CD	✗	✗	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓
	0H	LOCAL AUTHORITY	UK	CD	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓
	0W	DAY OF THE WEEK	HU	CD	✗	✗	✗	✓	✓	✗	✓	✓	✓	✗	✗	✗	✓
	0X	COLLISION INTERACTION TYPE	Misc	CD	✗	✗	✗	✓	✗	✗	✓	✗	✗	✗	✓	✓	✓
	0AB	REPORTING ORGANISATION	IT	-	✗	✗	✗	✓	✗	✓	✓	✗	✗	✗	✗	✗	✓
	0AD	NUMBER OF FATALITIES RECORDED	ES	CD	✗	✗	✗	✗	✗	✗	✓	✓	✓	✗	✗	✗	✓
	0AE	INHABITANTS OF LOCAL AUTHORITY / MUNCIPALITY	ES	CD	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✗	✓
	0A	RECORD TYPE (NEW/UPDATE)	UK	-	✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗

0T	Road Environment (Urban / Rural)	Road environment (urban/rural and LA) are covered, but only if an LA16 is completed, whereas it is in CADaS. It could be that NRA can derive the urban/rural distinction from other data such as road numbering etc.
0H	Local Authority	Recorded in several countries but presumably only where relevant to identifying data origins or responsibilities for policing / roads. Ireland, probably implicit in other fields.
0W	Day Of The Week	Day of the week is logged separately from Date by some, which may be considered wasteful since it can easily be derived from Date. However, in some databases (not just road related) it is included as a 'cross check' on manual entry, to highlight where a date may have been entered wrongly, because users may be more accurate in stating day of the week than actual date.
0X	Collision Interaction Type	A key difference between the countries with more fields in section (0) (IRE, DE, ES, NL) and those with less (UK, HU, IT) is whether they have a separate 'up front' section in which they not only record the vital elements such as the ID, Date, Location etc, but also then add aggregates of data from later sections of the form. For example a number add 'Total Fatalities', 'Collision Interaction Type'. This difference may not be significant. Where the source is from a largely paper based system, having the aggregation done during form completion is useful. Where data is either entered directly into a database or our source was a database output, the aggregation occurs automatically.
0AD	Number Of Fatalities Recorded	
0AB	Reporting Organisation	Appears in NL, IT and DE and is indicative of the fact that in some countries (DE for example) data reports originate from more than one reporting organisation or government level.
0AE	Inhabitants Of Local Authority/Municipality	Recorded in Germany and Spain and gives a rough measure of local population density. This is of interest as some countries prioritise works in more populated areas. The NRA have undertaken some bespoke analysis using GIS to count the number of residential dwellings near certain roads and combined this with Central Statistics Office (CSO) census information. Spatial joining of such data may prove to be a practical way of joining up databases.
0A	Record Type (New/Update)	Record Type (Update) appears to be unique to UK and DE. In UK at least we know this is because records can be reopened and more data added/edits made, up until the annual dataset is "frozen". In one other case, we had a comment from the national contact that updates were possible in their system, but there was not an identifier to show this status – just a most recent modification date.

(1) CIRCUMSTANCES

Gen Sect	Ref	Generic Variable Name	ORIGIN	Core Data	UK	IRE	IRE (LA)	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
					United Kingdom	Ireland	Ireland	Netherlands	Hungary	Italy	Germany	Spain	Lithuania	Malta	Joint	Joint	Netherlands
Bar length indicates the proportion of systems including the variable or a near equivalent, as judged in this assessment. (NOT INCLUDING NL+)					STATS 19 (2005)	PULSE (PC16 Form)	Local Auth LA16 Form	Police RTA Form (1992)	Form 1009/04	ISTAT (Undated)	From DeSTATIS	Undated (Safetynet)	Undated (Safetynet)	Police Form (Undated)	CARE / CADaS 2011	FARS 2011	Inc. Linked Data Sources
	1Z	ROAD SURFACE MATERIAL	NL	CD	✗	✗	✗	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	1T	WARNING SIGNS	IRE (LA16)	CD	✗	✗	✓	✗	✗	✓	✗	✓	✗	✓	✗	✗	✓
	1AC	ROAD SURFACE QUALITY	HU	CD	✗	✗	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗	✓
	1Y	ROADSIDE CONDITIONS	IRE (LA16)	CD	✗	✗	✓	✗	✗	✗	✗	✓	✗	✗	✓	✗	✓
	1AB	NUMBER OF TRAFFIC LANES	HU	CD	✗	✗	✗	✗	✓	✗	✗	✗	✗	✓	✓	✓	✓
	1C	SPEED LIMIT (Permanent)	UK	CD	✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✓	✓	✓
	1I	PEDESTRIAN CROSSING - PHYSICAL FACILITIES	UK	CD	✓	✗	✗	✓	✓	✗	✓	✗	✗	✗	✗	✗	✓
	1W	SIGHT DISTANCE L-R	IRE (LA16)	CD	✗	✗	✓	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗
	1AG	SAFETY RELATED ROAD DESIGN ELEMENTS	ES	CD	✗	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✓
	1H	PEDESTRIAN CROSSING - HUMAN CONTROL	UK	CD	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗
	1AA	INTENDED USERS	HU	CD	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✗	✓
	1N	CARRIAGEWAY HAZARDS	UK	CD	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗
	1O	POLICE REPORT BASED ON ATTENDANCE	UK	CD	✓	✗	✗	✓	✗	✗	✓	✗	✗	✗	✗	✗	✓

1Z	ROAD SURFACE MATERIAL	These differ from the Road Surface Conditions (collected in all countries except ES). The details behind 1Z and 1AC show that these are not about temporary conditions (wet, dry, oily etc) but the nature of the surface asset (material type and condition).
1AC	ROAD SURFACE QUALITY	
1T	WARNING SIGNS	These three items are covered if an LA16 is completed, but are recorded as standard in some other nations. Presence of Warning Signs (in IT, ES, MT), Roadside Conditions (soft verges etc) and Sight Distance L-R (in ES). Roadside conditions are included in CADaS as this can affect road accident progression and associated injuries.
1Y	ROADSIDE CONDITIONS	
1W	Sight Distance L-R (Left / Right)	
1AB	NUMBER OF TRAFFIC LANES	Number of traffic lanes is noted specifically in HU and MT, but from the UK case, we know that this is often implied by the road class or included in the narrative. However, it is included specifically in the CADaS data list.
1C	SPEED LIMIT (Permanent)	Speed Limit (Permanent) does not appear to be logged in PC16 or in LA16. However, the road class is very often logged so presumably the speed limit can be inferred in most cases, unless there is a localised change to the standard limit for the road class. It is not included in every nation but warrants a place in CADaS. Note that this is a good example of data that can be derived by linking to a roads database of some sort (as NL + does) but which requires care, since what is needed is the speed limit in force at the time of the event. This could change between the time event occurred and the last asset data review. The NRA have successfully used geospatial techniques to link to local speed limits as part of a bespoke project on traffic calming.
1I	PEDESTRIAN CROSSING - PHYSICAL FACILITIES	There are two items shown relating to pedestrian crossings, where others, including UK STATS19, appear to include some more detailed elements of the nature of the control, compared to what PC16 may pick up from its general fields about crossings or junctions. Reference to the STATS19 guide document (STATS20) would show the specific details of these additional fields.
1H	PEDESTRIAN CROSSING - HUMAN CONTROL	
1AG	SAFETY RELATED ROAD DESIGN ELEMENTS	Safety Designed Road Elements is a code from ES and LT. It encompasses the presence of a central reservation / guard-rail / direction signs / delineators / retro reflectors. Elements of this list are included within other codes for most countries including Ireland, but the use here is to highlight the presence as a set of specific safety design measures which may be noted.
1AA	INTENDED USERS	This may be specific to the two countries that list it – NL and HU. It relates to roads intended to be restricted for the use of cyclists (not just cycle lanes as part of a road) and pedestrians – i.e. cars should not be present at all. Such dedicated roads/routes may of course not be as common in Ireland as in NL or HU.
1N	CARRIAGEWAY HAZARDS	Interesting because it is almost a contributory factor. It refers to temporary hazards on the road, such as dislodged loads, previous accidents, injured pedestrians, animals, with the implication that they were in some way related the event occurring, even (for example) if the object/person/animal was not actually hit.
1O	POLICE REPORT BASED ON ATTENDANCE	Only of interest if the procedures in Ireland allow completion of the accident form without a police officer attending the scene. If so, then knowing whether a report is based on a site visit or just a reported event (perhaps by a MOP) is of interest.

(2) VEHICLES

Gen Sect	Ref	Generic Variable Name	ORIGIN	Core Data	UK	IRE	IRE (LA)	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
					United Kingdom	Ireland	Ireland	Netherlands	Hungary	Italy	Germany	Spain	Lithuania	Malta	Joint	Joint	Netherlands
Bar length indicates the proportion of systems including the variable or a near equivalent, as judged in this assessment. (NOT INCLUDING NL+)					STATS 19 (2005)	PULSE (PC16 Form)	Local Auth LA16 Form	Police RTA Form (1992)	Form 1009/04	ISTAT (Undated)	From DeSTATIS	Undated (Safetynet)	Undated (Safetynet)	Police Form (Undated)	CARE / CADaS 2011	FARS 2011	Inc. Linked Data Sources
	2N	FIRST POINT OF IMPACT / COLLISION TYPE	UK	CD	✓	✗	✗	✓	✗	✓	✗	✓	✓	✓	✗	✓	✓
	2L	VEHICLE LEAVING CARRIAGEWAY	UK	CD	✓	✗	✓	✓	✗	✓	✗	✓	✗	✗	✗	✓	✓
	2E	TOWING AND ARTICULATION	UK	CD	✓	✗	✗	✗	✗	✓	✗	✓	✗	✗	✓	✓	✗
	2BA	DRIVING EXPERIENCE LEVEL / FREQUENCY	HU	CD	✗	✗	✗	✓	✓	✓	✓	✗	✓	✗	✗	✗	✓
	2K	HIT OBJECT IN CARRIAGEWAY	UK	CD	✓	✗	✗	✓	✓	✓	✗	✗	✗	✗	✗	✓	✓
	2G	VEHICLE MOVEMENT COMPASS POINT	UK	CD	✓	✗	✓	✗	✓	✗	✗	✗	✗	✓	✗	✗	✗
	2BK	HAZARDOUS MATERIALS INVOVLEMENT	USA	CD	✗	✗	✗	✓	✓	✗	✓	✓	✗	✗	✗	✓	✓
	2X	JOURNEY PURPOSE	UK	CD	✓	✗	✗	✗	✗	✗	✗	✓	✗	✗	✓	✓	✗
	2S	HIT AND RUN	UK	CD	✓	✗	✗	✓	✗	✗	✓	✗	✓	✗	✗	✓	✓
	2CD	PROFESSIONAL DRIVER?	ES	CD	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✗	✗	✗
	2BH	VEHICLE WEIGHT	USA	CD	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✗	✓	✓
	2BP	VEH NUMBER OF OCCUPANTS	USA	CD	✗	✗	✗	✓	✗	✗	✓	✓	✗	✗	✗	✓	✓
	2BC	VEHICLE SPEED AT TIME OF ACCIDENT	HU	CD	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓	✗
	2BZ	CHARGES MADE AGAINST DRIVER	USA	CD	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✓	✓
	2CA	PRE-EXISTING DRIVER CONDITION/ IMPAIRMENT	USA	CD	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✓	✓
	2H	VEHICLE LOCATION AT TIME OF ACCIDENT (MAIN CARRIAG	UK	CD	✓	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✓	✓

2N	FIRST POINT OF IMPACT / COLLISION TYPE	These two items, included in 5 or 6 other countries, relate to accident sequence. They are not in CADaS, at least not in this specific sense. Vehicle leaving the carriageway is only picked up in Ireland as a data field (for analysis), if an LA16 investigation takes place, Although it would probably be present in the PC16 sketch. The LA16 form could be modified to capture vehicle GPS location before the collision as well as the first point of contact. From this a vector could be derived that determines direction of travel.
2L	VEHICLE LEAVING CARRIAGEWAY	
2E	TOWING AND ARTICULATION	Towing and Articulation is covered in more detail in several other nations, whereas the PC16 form only appears to note the case of an HGV with a semi-trailer
2BA	DRIVING EXPERIENCE LEVEL / FREQUENCY	Driving experience is not noted specifically in UK or in CADaS, but *is* noted in almost all the other countries examined. PC16 records the level of licence (full provisional etc.). Some of the other examples note the date/years held. **Hungary's example is unique in asking about how FREQUENTLY the person drives.**
2K	HIT OBJECT IN CARRIAGEWAY	PC16 does note some cases of this as part of 'SV Collision with', but this generic field gives a data point specifically on collisions with objects in a place where the vehicle IS supposed to be present, as distinct from objects hit after the vehicle had left the road.
2G	VEHICLE MOVEMENT COMPASS POINT	UK, HU and MT specifically record the direction the vehicle was pointing (before the accident) – as does LA-16, where collected. The UK use is to pinpoint direction of travel on two-way roads and is especially useful in describing multi-vehicle incidents.
2BK	HAZARDOUS MATERIALS INVOVLEMENT	Self –explanatory. Noted as a specific fields in NL, DE, HU & ES
2X	JOURNEY PURPOSE	This CADaS field only has a clear equivalent in UK and SPAIN, but could be considered to be an underlying contributory factor. The options appear to be checking suspected key accident contexts: UK 1 Journey as part of work / 2 Commuting to/from work / 3 Taking pupil to/from school / 4 Pupil riding to/from school / 5 Other / Not known ES 1 in his/her working time / 2 to/from work / 3 leaving for/returning from holidays / 4 leaving for/returning from bank holidays and weekends / 5 emergencies / 6 leisure / 7 others CADaS Not applicable / Route to/from school - education / route to / from work / Driving as part of the work / Leisure/Entertainment / Holiday / Driving lesson / Other / Unknown
2S	HIT AND RUN	Special field in UK, NL and DE. Unclear how it is handled in PC16.
2CD	PROFESSIONAL DRIVER?	Special field in ES and IT, though other in nations one could infer that some vehicle types are necessarily driven by professionals.
2BH	VEHICLE WEIGHT	Specific field in DE and IT. Relative vehicle weights in impacts could be used in analysis of accident progression or injury outcomes, but such analysis might also be done from reference data for different vehicle types.
2BP	VEH NUMBER OF OCCUPANTS	This could be just another 'on the form aggregation' which could be computed just as well after the event. However, it might also be a check field to ensure that the number of person records associated with each Vehicle ID matches the number of persons in the vehicle.

2BC	VEH SPEED AT TIME OF ACCIDENT	This is actually ONLY recorded (or estimated) in the form from HU, but was included here as it is interesting. Gathering or estimating it might give a direct indicator of the link between speed and outcomes than we get from the speed limit.
2BZ	CHARGES MADE AGAINST DRIVER	Specific to ES. Clearly something the police in every nation would know for their own purposes, even if not recorded on the accident report. However, it could be argued that knowing which drivers involved were charged with an offence could add an interesting insight into the on-site assessment of contributory factors.
2CA	PRE-EXISTING DRIVER CONDITION/ IMPAIRMENT	Also specific to Spain – again, potentially a useful addition to contributory factors, IF the police also note whether the pre-existing condition was a factor in the event.
2H	VEHICLE LOCATION AT TIME OF ACCIDENT (MAIN CARRIAGEWAY)	Used in UK and NL as one way of covering where each vehicle was prior to the accident, including (potentially) places where it should not have been (e.g. car on cycle lane/road). As with other items, it would be in the PC16 sketch.

(3) PEOPLE

Gen Sect	Ref	Generic Variable Name	ORIGIN	Core Data	UK	IRE	IRE (LA)	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
					United Kingdom	Ireland	Ireland	Netherlands	Hungary	Italy	Germany	Spain	Lithuania	Malta	Joint	Joint	Netherlands
	Bar length indicates the proportion of systems including the variable or a near equivalent, as judged in this assessment. (NOT INCLUDING NL+)				STATS 19 (2005)	PULSE (PC16 Form)	Local Auth LA16 Form	Police RTA Form (1992)	Form 1009/04	ISTAT (Undated)	From DeSTATIS	Undated (Safetynet)	Undated (Safetynet)	Police Form (Undated)	CARE / CADaS 2011	FARS 2011	Inc. Linked Data Sources
	3AH	CRASH HELMET WORN	HU	CD	✗	✗	✗	✓	✓	✓	✗	✓	✗	✓	✓	✓	✓
	3J	PEDESTRIAN MOVEMENT	UK	CD	✓	✗	✗	✓	✓	✗	✗	✓	✗	✓	✗	✓	✓
	3I	PEDESTRIAN LOCATION	UK	CD	✓	✗	✗	✓	✓	✗	✓	✓	✗	✗	✗	✓	✓
	3AJ	CHILD SAFETY SEAT	HU	CD	✗	✗	✗	✓	✓	✗	✗	✓	✗	✗	✓	✓	✓
	3AK	SEATING POSITION IN VEHICLE	EU/USA	CD	✗	✗	✗	✓	✗	✓	✗	✗	✗	✓	✓	✓	✓
	3AI	AIR BAG	HU	CD	✗	✗	✗	✗	✓	✗	✗	✗	✓	✗	✓	✓	✗
	3AP	DIED AT SCENE	USA	CD	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓	✓
	3AS	INJURY FROM HEAVY BRAKING / FALLING FROM VEHICLE	IT	CD	✗	✗	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓
	3N	BUS OR COACH PASSENGER	UK	CD	✓	✗	✗	✓	✗	✗	✓	✗	✗	✗	✗	✗	✓
	3Q	PEDEST'N INJURED IN COURSE OF 'ON THE ROAD' WORK	UK	CD	✓	✗	✗	✓	✗	✗	✓	✗	✗	✗	✗	✗	✓

3AH	CRASH HELMET WORN	The presence/use of safety equipment (Crash Helmet, Air Bag etc.). The full log shows a proliferation of very specific fields checking individual safety equipment. PC16 has whether 'Seat belt *etc.*' was being used and officer training may direct them to use this field to record presence of a crash helmet or not. Similarly, PC16 asks about 'Armbands etc.' – which might be used for any relevant high-visibility clothing – but some other databases are being more specific
3AJ	CHILD SAFETY SEAT	
3J	PEDESTRIAN MOVEMENT	Some other datasets have greater detail on pedestrian involvement, which of course it less predictable than that of vehicles (which should only travel along the road). Movement may be expressed as compass point - location is done relative to the vehicle which hit them.
3I	PEDESTRIAN LOCATION	
3AK	SEATING POSITION IN VEHICLE	PC16 records front/rear seating, but others show precise seat occupied (front/rear, near/offside or centre). CADaS differs by showing whether they were front/rear and then sitting/standing. This greater detail is partly reflective of whether icons/sketches are being used on the form or electronic device, where it is easier to just mark the seating position. The purpose of the more exact placement may be in the analysis of injuries relative to the seating position or point of impact.
3AI	AIR BAG	The presence of an Air Bag is noted in HU and LT and also whether out-of-order. Only the much more detailed FARS actually states whether the bag deployed. Obviously the presence *and operation) of an air bag relates to injury outcomes. On the other hand, it may be that as (a) air bags are becoming standard equipment and (b) there seems little doubt that they are a good idea, the recording of the presence of a bag item will become less important than whether it deployed or was effective. In modern cars there are now of course multiple air-bags in diverse positions, to analyse simply on air bag yes/no may have limited value.
3AP	DIED AT SCENE	NL, HU specifically note death at the scene as a clear statement, beyond the more general death within 30 days (date unspecified).
3AS	INJURY FROM HEAVY BRAKING / FALLING FROM VEHICLE	This is a very specialised field which is limited to injuries where there was no vehicle impact – the injuries being caused by the motion of skidding or sudden braking, or by falling out of the vehicle. The field only appears specifically in IT and is included here as it seems it would not be picked up in PC16 unless noted in the narrative description.
3N	BUS OR COACH PASSENGER	Three countries separate out passengers in buses/coaches from other types of passenger, perhaps because the injury outcomes are different, owing to the spatial differences compared to cars.
3Q	PEDEST'N INJURED IN COURSE OF 'ON THE ROAD' WORK	Not just targeting infrastructure workers, but people with work that places them on or near to the road – i.e. the presence of the road / traffic is part of the reason they were present.

(4) CONTRIBUTORY FACTORS

Gen Sect	Ref	Generic Variable Name	ORIGIN	Core Data	UK	IRE	IRE (LA)	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
		Bar length indicates the proportion of systems including the variable or a near equivalent, as judged in this assessment. (NOT INCLUDING NL+)			United Kingdom STATS 19 (2005)	Ireland PULSE (PC16 Form)	Ireland Local Auth LA16 Form	Netherlands Police RTA Form (1992)	Hungary Form 1009/04	Italy ISTAT (Undated)	Germany From DeSTATIS	Spain Undated (Safetynet)	Lithuania Undated (Safetynet)	Malta Police Form (Undated)	Joint CARE / CADaS 2011	Joint FARS 2011	Netherlands Inc. Linked Data Sources
	4D	IMPAIRMENT OR DISTRACTION: ALCOHOL, DRUGS, MEDICAL	UK	CD	✓	✗	✗	✗	✗	✓	✓	✓	✗	✓	✓	✓	✗
	4H	PEDESTRIAN ONLY (CASUALTY OR UNINJURED)	UK	CD	✓	✗	✗	✗	✗	✗	✓	✓	✓	✗	✗	✓	✓
	4G	VISION AFFECTED BY	UK	CD	✓	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✓	✗
	4A	VEHICLE DEFECTS	UK	CD	✓	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✓	✗
	4I	PEDESTRIAN IMPAIRMENT	UK	CD	✓	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✓	✗
	4V	SUDDEN ILLNESS	MA	CD	✗	✗	✗	✓	✗	✗	✗	✗	✗	✓	✗	✗	✓
	4C	DRIVER/RIDER ERROR OR REACTION	UK	CD	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	4J	SPECIAL CODES	UK	CD	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	4K	DRIVER MANOUVRED TO AVOID	USA	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	4L	PRE-IMPACT STABILITY	USA	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	4M	PRE-IMPACT LOCATION	USA	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗

4D	IMPAIRMENT OR DISTRACTION: ALCOHOL, DRUGS, MEDICAL	Of course the PC16 form *does* give information on this and reading the 'Garda opinion' section would tell you whether they attributed the fault to these impairments. However, it is only through the narrative field "specify", on manual analysis of the data – it is not accessible as a specific analytical field. The factor is distinct in CADaS and it may be that if EU nations gradually move to include the CADaS fields clearly, it will become the norm for this to be done as a defined field with options, rather than later analysis of a narrative field. ***Note that this comment applies to the absence of many of the contributory factor issues from the PC16, simple because of the use of narrative fields to express these sorts of views***.
4H	PEDESTRIAN ONLY (CASUALTY OR UNINJURED)	PC16 does make it clear, in a check-box, when a pedestrian was judged to be the principal cause of the event. This field has been left in as 'unmatched' (perhaps a little harshly) to highlight the difference where in some countries, assignment of responsibility for the event *solely* to the injudicious action of a pedestrian is possible, which is a slightly more exacting judgement.
4I	PEDESTRIAN IMPAIRMENT	UK and IT record whether a pre-existing impairment (disability mental or physical) of a pedestrian was a contributory factor.
4G	VISION AFFECTED BY	PC16 has one option - sight distance – listed in this area. Others have a more detailed list of what was affecting vision, including temporary features (parked vehicles), emerging factors (vegetation) and infrastructure elements.
4A	VEHICLE DEFECTS	As with field 4D (impairment), PC16 allows a check-box that 'vehicle factors' were involved but it falls to the narrative to give any details.
4V	SUDDEN ILLNESS	Covers onset of acute illness (such as heart-attack) whilst driving as a contributory factor to an accident, although the health outcomes directly from the sudden illness would not be attributed to the accident. It is less clear how this field is used in the case of more minor illnesses and whether it is intended to only apply to drivers, as opposed to passengers (such as driver distracted by child passenger being ill) or indeed pedestrians.
4C	DRIVER/RIDER ERROR / REACTION	List of errors made in braking, turning etc. Again, PC16 would probably have insights in the narrative fields, not in analytical fields.
4J	SPECIAL CODES	The name here is rather broad, but it comes from the UK systems and includes 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
4K	DRIVER MANOUVERED TO AVOID	These last 3 codes are only seen in the USA FARS example and are perhaps only derived from expert examination of the scene, rather than witness accounts. 4K links the final outcome back to an initial driver action intended to avoid an accident, 4L to a loss of control (including 'no driver present'). 4M looks at the vehicle route just before the first impact.
4L	PRE-IMPACT STABILITY	
4M	PRE-IMPACT LOCATION	

B: Possible Reductions

Filter Criteria: *IRE PC16 collects item **AND** 2 or less other national datasets include the field*

For this analysis, the CoreData filter was turned off, since it is relevant to consider all fields gathered on the PC16 and some fields we judged 'non core' may be the ones that are particular to Ireland.

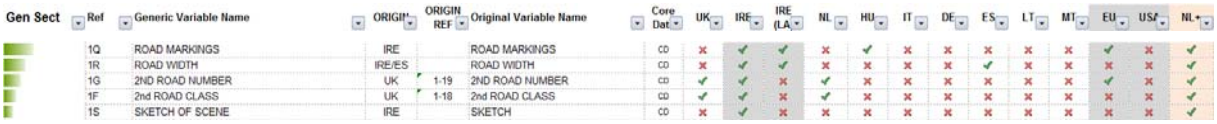
6.54 At first glance, many of the items here would be information one might think would be present in other systems. In each case, a judgement has been made that the PC16 data field is in some way different to the generic case. For example, on **'Driver Resident'** – the PC16 asks whether this is the UK / NI or other. STATS 19 asks whether UK and then distinguishes between 'unknown' and 'parked or unattended'. This is an example where the IRE system is better or worse than a comparator, but it is different.

(0) INCIDENT REFERENCE INFORMATION

Gen Sect	Ref	Generic Variable Name	ORIGIN	ORIGIN REF	Original Variable Name	Core Dat	UK	IRE	IRE (LA	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
	0I	LOCATION (EASTING/LONGITUDE)	UK	1-11	LOCATION (Grid Ref)	CD	✓	✓	✓	×	×	×	×	×	×	×	✓	✓	✓
	0J	LOCATION (NORTHING/LATTITUDE)	UK	1-11	LOCATION (Grid Ref)	CD	✓	✓	✓	×	×	×	×	×	×	×	✓	✓	✓
	0M	DATE REPORTED TO POLICE OR OTHER EMERGENCY SERVICES	IRE		Reported Date	CD	×	✓	✓	✓	×	✓	×	×	×	×	×	×	✓
	0L	INCIDENT TYPE (SUB-CATEGORY)	IRE		Type	CD	×	✓	×	×	×	×	✓	×	✓	×	×	×	×
	0K	INCIDENT CATEGORY (WIDER THAN TRAFFIC)	IRE		Category	CD	×	✓	×	×	×	×	✓	×	×	×	×	×	×
	0N	DATE REPORTED TO POLICE OR OTHER EMERGENCY SERVICES	IRE		Reported Time	CD	×	✓	×	✓	×	×	×	×	×	×	×	×	✓
	0P	CONTRIBUTORY FACTOR (HIGH LEVEL)	IRE		Contrib Factor	CD	×	✓	×	✓	×	×	×	×	×	×	×	×	✓
	0O	DATE OF DETECTION (IF NOT REPORTED)	IRE		Detected Date	CD	×	✓	×	×	×	×	×	×	×	×	×	×	×

0I	LOCATION (EASTING/LONGITUDE)	Recorded directly in UK and Ireland and also in CADaS. However, although not present on many of the sample forms, it is clear that with the direction of travel towards GPS linked systems in police vehicles, this is becoming a standard when upgrading.
0J	LOCATION (NORTHING/LATTITUDE)	
0M **0N**	DATE/TIME REPORTED TO POLICE OR OTHER EMERGENCY SERVICES	All datasets include the date and (estimated) time of the event, but IRE and IT also record the date/time the incident was reported to the emergency services. The delay between the incident occurring the report reaching the emergency services is useful in assessing not only response times (how much of the total response time was a delay in the initial reporting) but any contributory effect it might have on outcomes, such as deterioration of injured persons. Whilst such data might be available from other police data (call centre logging) separately, although it is then less accessible to any incident analysis.
0K	INCIDENT CATEGORY (WIDER THAN TRAFFIC)	Probably both examples arising from PC16 being a form used for all incidents, not just road traffic related. All the other examples are road specific forms or systems.
0L	INCIDENT TYPE (SUB-CATEGORY)	
0P	CONTRIBUTORY FACTOR (HIGH LEVEL)	Only IRE and NL seek to record a summary or principal contributory factor in the report overview area, although others do so at the end of the report.
0O	DATE OF DETECTION (IF NOT REPORTED)	Ireland further reports the 'Date of Detection', but this may be present because the PC16 form is not confined to use in road accidents – other forms of incident may not be reported, but detected in the course of other police duties.

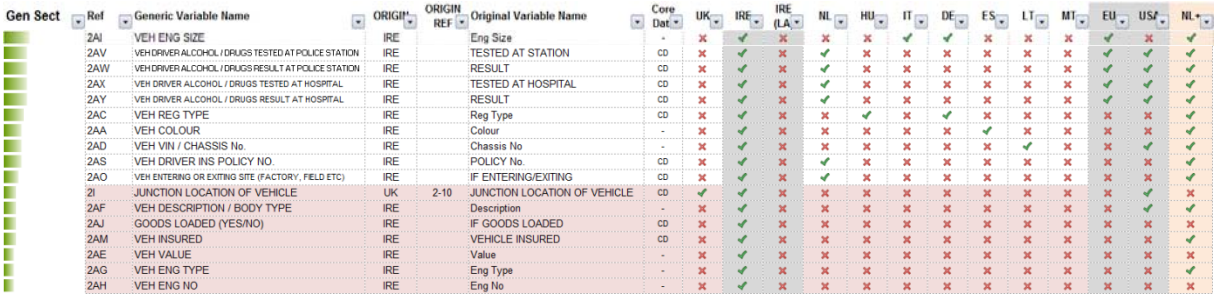
(1) CIRCUMSTANCES



Gen Sect	Ref	Generic Variable Name	ORIGIN	ORIGIN REF	Original Variable Name	Core Dat	UK	IRE	IRE (LA	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
	1Q	ROAD MARKINGS	IRE		ROAD MARKINGS	CD	✗	✓	✓	✗	✓	✗	✗	✗	✗	✗	✓	✗	✓
	1R	ROAD WIDTH	IRE/ES		ROAD WIDTH	CD	✗	✓	✓	✗	✗	✗	✗	✓	✗	✗	✗	✗	✓
	1G	2ND ROAD NUMBER	UK	1-19	2ND ROAD NUMBER	CD	✓	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓	✗	✓
	1F	2nd ROAD CLASS	UK	1-18	2nd ROAD CLASS	CD	✓	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	1S	SKETCH OF SCENE	IRE		SKETCH	CD	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓

	PC16 or Both	
1Q	ROAD MARKINGS	Road markings and width are infrastructure related items and hence other nations may rely on subsequent analysis based on asset information for this. It is interesting to note that NL is pulling them from a link to an asset database. However, one could take the view that they are potential contributors to a more significant proportion of accidents in Ireland than for some other nations. This could especially be the case in more rural areas - an area of particular focus in Irish road safety. If so, there are good grounds to retain them as important in the Irish context. The NRA is looking at capturing more information about the current condition of the network so this may be addressed in the future.
1R	ROAD WIDTH	
1G	2ND ROAD NUMBER	Specific recording of the number and class of the 2nd road, where the accident was at a junction – noted by both UK and IRE, seems less common that we would have thought. It would seem to be a field worth retaining in any system. In time, and with the adoption and roll out of the Tetra radio GPS facility by the Garda, the need to retain these fields in PC16 may become redundant.
1F	2nd ROAD CLASS	
1S	SKETCH OF SCENE	The limited number of systems providing space for a sketch of the scene was also unexpected. (Marking this as missing from LA16 is literally true, but of course LA16 allows for *photos* of the scene). What we know from our contacts is that in some cases a sketch does exist, but it is/was only accessible to the police – not stored in the database itself.

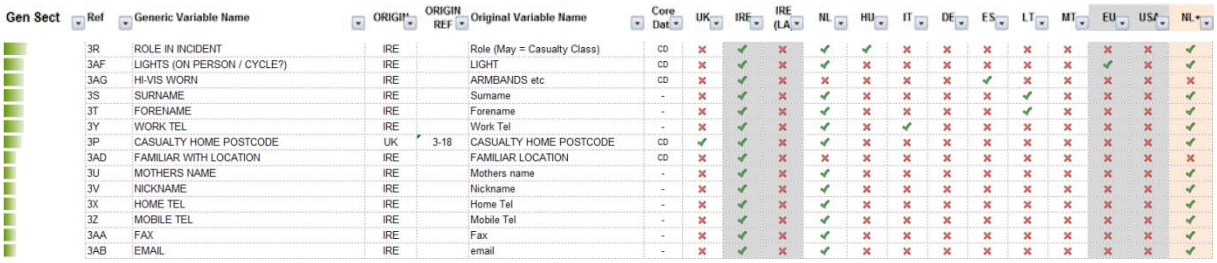
(2) VEHICLES



Gen Sect	Ref	Generic Variable Name	ORIGIN	ORIGIN REF	Original Variable Name	Core Dat	UK	IRE	IRE (LA	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
	2AI	VEH ENG SIZE	IRE		Eng Size	-	✗	✓	✗	✗	✗	✓	✓	✗	✗	✗	✓	✗	✓
	2AV	VEH DRIVER ALCOHOL / DRUGS TESTED AT POLICE STATION	IRE		TESTED AT STATION	CD	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓	✓	✓
	2AW	VEH DRIVER ALCOHOL / DRUGS RESULT AT POLICE STATION	IRE		RESULT	CD	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓	✓	✓
	2AX	VEH DRIVER ALCOHOL / DRUGS TESTED AT HOSPITAL	IRE		TESTED AT HOSPITAL	CD	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓	✓	✓
	2AY	VEH DRIVER ALCOHOL / DRUGS RESULT AT HOSPITAL	IRE		RESULT	CD	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓	✓	✓
	2AC	VEH REG TYPE	IRE		Reg Type	CD	✗	✓	✗	✗	✓	✗	✓	✗	✗	✗	✗	✗	✓
	2AA	VEH COLOUR	IRE		Colour	-	✗	✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✓
	2AD	VEH VIN / CHASSIS No.	IRE		Chassis No	-	✗	✓	✗	✗	✗	✗	✗	✗	✓	✗	✗	✓	✓
	2AS	VEH DRIVER INS POLICY NO.	IRE		POLICY No.	CD	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2AO	VEH ENTERING OR EXITING SITE (FACTORY, FIELD ETC)	IRE		IF ENTERING/EXITING	CD	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2I	JUNCTION LOCATION OF VEHICLE	UK	2-10	JUNCTION LOCATION OF VEHICLE	CD	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	2AF	VEH DESCRIPTION / BODY TYPE	IRE		Description	-	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✓
	2AJ	GOODS LOADED (YES/NO)	IRE		IF GOODS LOADED	CD	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	2AM	VEH INSURED	IRE		VEHICLE INSURED	CD	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2AE	VEH VALUE	IRE		Value	-	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	2AG	VEH ENG TYPE	IRE		Eng Type	-	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2AH	VEH ENG NO	IRE		Eng No	-	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

		Alcohol and drugs testing
2AV	VEH DRIVER ALCOHOL / DRUGS TESTED AT POLICE STATION	PC16 and NL appears to be the only system in our sample that includes specific fields for the testing and result of alcohol separately at three locations – the site, the police station and hospital. Whilst it is probably possible to work this out the location of a test in other systems, PC16 has these extra fields which allow the exact sequence to be established, including the outcomes of a series of tests. It must also be the case that the police station/ hospital these details are recorded off-site / post accident, so there is no issue here of time taken on site for the extra data.
2AW	VEH DRIVER ALCOHOL / DRUGS RESULT AT POLICE STATION	
2AX	VEH DRIVER ALCOHOL / DRUGS TESTED AT HOSPITAL	
2AY	VEH DRIVER ALCOHOL / DRUGS RESULT AT HOSPITAL	
		Detailed Vehicle Specification
2AA	VEH COLOUR	The clearest example of the PC16 collecting data that does not appear to be collected in other systems, is this detail in the vehicle specification. If police officers are indeed completing these very detailed fields on site and doing so at most accidents (or even if they do it from manual access to vehicle details back in the office), then this is an area where the NRA could consider taking a strong position on change. Action to link the police databases to the national vehicle licensing system (as done in NL+ and as is being considered by others) would populate these details automatically and probably more reliably. There might then be an opportunity, to use that police time to record other details, including contributory factors, that can only be gathered on the site, at the time of the accident.
2AC	VEH REG TYPE	
2AD	VEH VIN / CHASSIS No.	
2AE	VEH VALUE	
2AF	VEH DESCRIPTION / BODY TYPE	
2AG	VEH ENG TYPE	
2AH	VEH ENG NO	
2AI	VEH ENG SIZE	
		Insurance
2AM	VEH INSURED	It is the case that some other systems may capture this under a more generic “documents in order” field or, in the case of NL+ ,from a link to a Motor Insurance Database. However, it does appear that PC16 is the only form with a space to collect the insurance policy number directly.
2AS	VEH DRIVER INS POLICY NO.	
		Other items
2AJ	GOODS LOADED (YES/NO)	These two items – apparently related to interest haulage / industry vehicles appears in only IRE and NL. It would be interesting to know how much each of the codes is used and what analysis makes use of them, to see whether they merit a space on the form.
2AO	VEH ENTERING OR EXITING SITE (FACTORY, FIELD ETC)	
2I	JUNCTION LOCATION OF VEHICLE	Not an issue – appears in the list simply because the PC16 options are stated a little differently to others

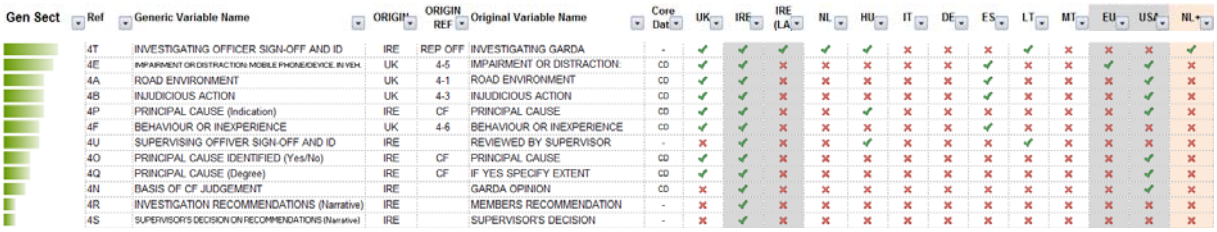
(3) PEOPLE



Gen Sect	Ref	Generic Variable Name	ORIGIN	ORIGIN REF	Original Variable Name	Core Dat	UK	IRE	IRE (LA	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
	3R	ROLE IN INCIDENT	IRE		Role (May = Casualty Class)	CD	✗	✓	✗	✓	✓	✗	✗	✗	✗	✗	✗	✗	✓
	3AF	LIGHTS (ON PERSON / CYCLE?)	IRE		LIGHT	CD	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓	✗	✓
	3AG	HI-VIS WORN	IRE		ARMBANDS etc	CD	✗	✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗
	3S	SURNAME	IRE		Surname	-	✗	✓	✗	✓	✗	✗	✗	✗	✓	✗	✗	✗	✓
	3T	FORENAME	IRE		Forename	-	✗	✓	✗	✓	✗	✗	✗	✗	✓	✗	✗	✗	✓
	3Y	WORK TEL	IRE		Work Tel	-	✗	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓
	3P	CASUALTY HOME POSTCODE	UK	3-18	CASUALTY HOME POSTCODE	CD	✓	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	3AD	FAMILIAR WITH LOCATION	IRE		FAMILIAR LOCATION	CD	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	3U	MOTHERS NAME	IRE		Mothers name	-	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	3V	NICKNAME	IRE		Nickname	-	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	3X	HOME TEL	IRE		Home Tel	-	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	3Z	MOBILE TEL	IRE		Mobile Tel	-	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	3AA	FAX	IRE		Fax	-	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	3AB	EMAIL	IRE		email	-	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓

3R	ROLE IN INCIDENT	This appears simply because it is recorded slightly differently in PC16 to some other examples. Otherwise it is comparable to fields such as Casualty Class and is clearly a valuable item.
3AF	LIGHTS (ON PERSON / CYCLE?)	Whilst other systems do list a number of specific safety related items, it appears these two appear only on the PC16 and on other sample (Lights in NL, Hi Vis in ES)
3AG	HI-VIS WORN	
3AD	FAMILIAR WITH LOCATION	The PC16 appears to be the only example that specifically asks this question. Again, it is reaching for a contributory factor.
		Full Person Details
3S	SURNAME	These are examples of fields which we filtered out as "non core", in the sense that equivalent information will be gathered in other police systems, but will have been redacted in the sample field list to which we have had access. As also noted earlier, the fact that the PC16 is a general police incident form – not exclusive to road incidents – probably accounts for it having such a detailed set of personal information fields. Having said that, where we can see the level of detail recorded on each person, the PC16 is still more detailed, gathering data such as Mother's name and Nickname.
3T	FORENAME	
3Y	WORK TEL	
3P	CASUALTY HOME POSTCODE	
3U	MOTHERS NAME	
3V	NICKNAME	
3X	HOME TEL	
3Z	MOBILE TEL	
3AA	FAX	
3AB	EMAIL	

(4) CONTRIBUTORY FACTORS



Gen Sect	Ref	Generic Variable Name	ORIGIN	ORIGIN REF	Original Variable Name	Core Dat	UK	IRE	IRE (LA	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
	4T	INVESTIGATING OFFICER SIGN-OFF AND ID	IRE	REP OFF	INVESTIGATING GARDA	-	✓	✓	✓	✓	✓	×	×	×	✓	×	×	×	✓
	4E	IMPAIRMENT OR DISTRACTION: MOBILE PHONE/DEVICE. IN VEH.	UK	4-5	IMPAIRMENT OR DISTRACTION:	CD	✓	✓	×	×	×	×	×	✓	×	×	✓	✓	×
	4A	ROAD ENVIRONMENT	UK	4-1	ROAD ENVIRONMENT	CD	✓	✓	×	×	×	×	×	✓	×	×	×	✓	×
	4B	INJUDICIOUS ACTION	UK	4-3	INJUDICIOUS ACTION	CD	✓	✓	×	×	×	×	×	✓	×	×	×	✓	×
	4P	PRINCIPAL CAUSE (Indication)	IRE	CF	PRINCIPAL CAUSE	CD	✓	✓	×	×	✓	×	×	×	×	×	×	✓	×
	4F	BEHAVIOUR OR INEXPERIENCE	UK	4-6	BEHAVIOUR OR INEXPERIENCE	CD	✓	✓	×	×	×	×	×	✓	×	×	×	×	×
	4U	SUPERVISING OFFIVER SIGN-OFF AND ID	IRE		REVIEWED BY SUPERVISOR	-	×	✓	×	×	✓	×	×	×	✓	×	×	×	×
	4O	PRINCIPAL CAUSE IDENTIFIED (Yes/No)	IRE	CF	PRINCIPAL CAUSE	CD	✓	✓	×	×	×	×	×	×	×	×	×	✓	×
	4Q	PRINCIPAL CAUSE (Degree)	IRE	CF	IF YES SPECIFY EXTENT	CD	✓	✓	×	×	×	×	×	×	×	×	×	✓	×
	4N	BASIS OF CF JUDGEMENT	IRE		GARDA OPINION	CD	×	✓	×	×	×	×	×	×	×	×	×	✓	×
	4R	INVESTIGATION RECOMMENDATIONS (Narrative)	IRE		MEMBERS RECOMMENDATION	-	×	✓	×	×	×	×	×	×	×	×	×	×	×
	4S	SUPERVISOR'S DECISION ON RECOMMENDATIONS (Narrative)	IRE		SUPERVISOR'S DECISION	-	×	✓	×	×	×	×	×	×	×	×	×	×	×

4E	IMPAIRMENT OR DISTRACTION: MOBILE PHONE/ DEVICE. IN VEH.	There seems little doubt that this ought to be collected, given the ever increasing presence of personal electronic devices. We would expect to see it come through as an explicit item in more national systems as they update and to reflect legal prohibitions, especially on phone use.
4A	ROAD ENVIRONMENT	No question that this ought to be on the list of potential factors. We note that the UK form is more detailed than the PC16. The UK example includes: UK : 101 Poor or defective road surface / 102 Deposit on road (eg oil, mud, chippings) / 103 Slippery road (due to weather) / 104 Inadequate or masked signs or road markings / 105 Defective traffic signals / 106 Traffic calming (eg speed cushions, road humps, chicanes) / 107 Temporary road layout (eg contraflow) / 108 Road layout (eg bend, hill, narrow carriageway) / 109 Animal or object in carriageway ES picks up some road environment elements in a single judgement field called "Possible Concurrent Factors".
4B	INJUDICIOUS ACTION	Clearly an area that an investigating officer would consider in the PC16 form. Again, it is interesting to see the sort of codification UK/ES have done on this. 301 Disobeyed automatic traffic signal / 302 Disobeyed "Give Way" or "Stop" sign 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 Again, ES picks up some elements of the UK "INJUDICIOUS ACTION" in their "Possible Concurrent Factors" field.
4F	BEHAVIOUR OR INEXPERIENCE	As above – the example from UK is that this is codified using 601 Aggressive driving / 602 Careless, reckless or in a hurry / 603 Nervous, uncertain or panic / 604 Driving too slow for conditions, or slow vehicle (eg tractor) / 605 Learner or inexperienced driver/rider / 606 Inexperience of driving on the left / 607 Unfamiliar with model of vehicle Again, ES picks up some elements of the factor in their "Possible Concurrent Factors" field.
		Initial investigation details
4P	PRINCIPAL CAUSE (Indication)	This set of field is interesting because it appears as part of the actual PC16 form, but is clearly addressing issues of judgement around contributory factors, in a way that is not apparent in most of the other samples, except UK STATS19. The appearance of these "extra" fields in the contributory factors area is encouraging and we have already commented on this being the area of focus of ongoing developments in EU and member state systems. It is interesting to compare the PC16 approach, which mixes a few analytical fields with space for very short narrative explanation, with that of UK STATS19, which is much more codified and hence immediately accessible to direct statistical analysis of the data.
4O	PRINCIPAL CAUSE IDENTIFIED (Yes/No)	
4Q	PRINCIPAL CAUSE (Degree)	
4N	BASIS OF CF JUDGEMENT	
4R	INVESTIGATION RECOMMENDATIONS	
4S	SUPERVISOR'S DECISION ON RECOMMENDATIONS	
		Involved Officers ID and Sign Off
4T	INVESTIGATING OFFICER SIGN-OFF AND ID	Whilst these two items appear in the list because they are not found in that many other samples, we doubt that the information is unavailable in all systems, but is shown on the samples which were database downloads rather than actual forms.
4U	SUPERVISING OFFICER SIGN-OFF AND ID	

C – Comparision with CADaS

6.55 The development of the CADaS set of data fields is intended to form a database field map, where the individual data fields are sufficiently broad and specific enough to support analyses that will produce useful statistics, identify key road accident factors and support trend analysis. It will also support meaningful comparisons between nations and the European average.

6.56 In comparing Ireland's data fields with those included in the CADaS set, we are not suggesting that the CADaS set is definitive and we recognise that there are other aspects of data recording (e.g. data collected by police to inform a possible criminal prosecution) that CADaS is not intended to address, but a considerable amount of international and academic effort went into deriving the CADaS list, so it is interesting to see how other countries compare with the CADaS list.

6.57 **The PC16 form appears to match 36 out of the 52 CADaS fields.**

6.58 The CADaS fields for which PC16 does not appear to have a simple direct match are as follows:

		CADaS Fields Matched	28	36	14	37	52	46
Gen Sect	Ref	Generic Variable Name	UK	IRE	IRE (LA	NL	EU	NL+
			United Kingdom	Ireland	Ireland	Netherlands	Joint	Netherlands
		Bar length indicates the proportion of systems including the variable or a near equivalent, as judged in this assessment. (NOT INCLUDING NL+)	STATS 19 (2005)	PULSE (PC16 Form)	Local Auth LA16 Form	Police RTA Form (1992)	CARE / CADaS 2011	Inc. Linked Data Sources
0) INCIDENT REFERENCE INFORMATION								
	0H	LOCAL AUTHORITY	✓	✗	✓	✓	✓	✓
	0T	ROAD ENVIRONMENT (URBAN / RURAL)	✗	✗	✓	✓	✓	✓
	0X	COLLISION INTERACTION TYPE	✗	✗	✗	✓	✓	✓
1) CIRCUMSTANCES								
	1C	SPEED LIMIT (Permanent)	✓	✗	✗	✓	✓	✓
	1N	CARRIAGEWAY HAZARDS	✓	✗	✗	✗	✓	✗
	1Y	ROADSIDE CONDITIONS	✗	✗	✓	✗	✓	✓
	1AB	NUMBER OF TRAFFIC LANES	✗	✗	✗	✗	✓	✓
2) VEHICLES								
	2E	TOWING AND ARTICULATION	✓	✗	✗	✗	✓	✗
	2X	JOURNEY PURPOSE	✓	✗	✗	✗	✓	✗
	2BD	ACTIVE SAFETY EQUIPMENT	✗	✗	✗	✗	✓	✓
	2BE	VEHICLE DRIVE SYSTEM	✗	✗	✗	✗	✓	✓
3) PEOPLE								
	3AH	CRASH HELMET WORN	✗	✗	✗	✓	✓	✓
	3AI	AIR BAG	✗	✗	✗	✗	✓	✗
	3AJ	CHILD SAFETY SEAT	✗	✗	✗	✓	✓	✓
	3AK	SEATING POSITION IN VEHICLE	✗	✗	✗	✓	✓	✓
4) CONTRIBUTORY FACTORS								
	4D	IMPAIRMENT OR DISTRACTION: ALCOHOL, DRUGS, MEDICAL	✓	✗	✗	✗	✓	✗

6.59 These 16 items have been discussed in Analysis A (Possible additions), since all the CADaS items appear in the generic field list being used here. As has already been noted in Analysis A, it may be possible to derive a number of these items from other existing PC16 fields using

mapping rules. The geospatial joining of road collision data with roads and demographics that has been realised by the LGCSB (MapInfo/MapRoad) and the Health Service Executive (COLLSTATS/ATLAS) should be explored as a route to deliver this. The RSA and NRA should explore this possibility to understand how it could be shared with potential interested parties.

6.60 For interest, the UK and NL match columns have been shown as well, as is that for NL+. (NL+ is an expanded list of fields, given to us by NL contacts, including all data which can now be generated using direct links from the direct police database and other databases such as the vehicle licensing or road asset systems.)

6.61 The basic NL data collection covers 37 of the 52 CADaS data fields, which is about 0 about the same as Ireland's PC16. However, the enhanced, NL+ manages to cover 46 items out of 52. This illustrates how the addition of links to other data sources enables NL to collect a richer data set to support subsequent analysis.

Summary of data collection comparisons

6.62 In general we believe that the content of the PC16 and LA16 forms is in line with best practice. We have undertaken a high level comparison of road collision data fields in the police forms of a selection of countries, and the data captured in Ireland is amongst the most comprehensive. We have not identified any glaring omissions in what is currently collected.

6.63 In the spirit of continuous improvement, and in order to determine whether or not there are additional data fields that could be collected, or if there are data fields that Ireland currently collects that appear redundant in comparison to other countries, we have compared the individual road collision data fields collected under the headings of:

- Incident reference
- Circumstances
- Vehicles
- People
- Contributory factors

6.64 **Incident reference** – Whilst the LA16 form picks up whether or not the incident occurred in an urban or rural environment, this is something that could be collected more routinely. In addition some other countries indicate what the local population density is near the incident location. A similar outcome could be realised in Ireland by linking spatially linking the road collision location to demographic information held by the CSO. There does not appear to be any obvious superfluous data items collected in Ireland under this heading.

6.65 **Circumstances** – the road surface material and general condition are not routinely collected in Ireland whereas other countries do. Other countries are increasingly collecting local infrastructure asset data at the location of the road collision. This includes: roadside furniture; number of lanes; local speed limit; vicinity and type of pedestrian crossing; existence of specific safety measures (such as median barriers). There does not appear to be any obvious superfluous data items collected in Ireland under this heading.

6.66 **Vehicles** – Ireland does not currently collect the first point of impact in the road collision nor does it capture if the vehicle hit an object on the road, although both could be inferred by examination of the PC16 sketches. The experience of the driver involved in the road collision is also not covered in Ireland although this is addressed by several other countries. The PC16 form includes about 8 data fields associated with the vehicle, make, type, colour etc. that no other country appears to collect. There are data fields about alcohol and drugs testing of the driver that is included in the PC16 and very few other countries. This could perhaps be rationalised by combining with alcohol and drugs impairment data fields as contributory factors for the road collision.

6.67 **People** – apart from locating pedestrians involved in a collision on a zebra or light controlled crossing in the LA16, Ireland does not collect data about the movement and location of pedestrians involved in the road collision (although as before this may be inferred from the PC16 road collision sketch). In addition it does not capture data associated with pedestrians (or workers), injured whilst working on the road. There is increasing interest in understanding the statistics associated with this group of people within the European Community and we note that the proposed revisions to the PC16 form include more detail about pedestrian movements and this will address this shortcoming.

6.68 **Contributory factors** - It is a general weakness of routine road collision data that there is usually very little information provided about the root causes and contributory factors of the road collisions. Several countries have initiated detailed road collision investigation teams to address this point. As far as routine data collection is concerned several countries capture impairment of the driver involved in the road collision as a result of drugs or alcohol as a contributory factor. Ireland does not and (as indicated above) we suggest that this could be refined by realigning what is currently reported under the 'Vehicle' category. In addition Ireland does not record whether or not vision impairment by some object was a contributory factor. Some other countries do. One area that is covered in the PC16 in Ireland, which most other countries do not address explicitly, is 'Road Environment'. We suggest that the options under this category could be refined to capture additional information such as road surface material and road condition – which we identified above as a possible addition under 'Circumstances'.

6.69 The companion report to this one makes more explicit recommendations about how road collision accident contributory factors could be reported more meaningfully in the LA16 form and this would address many of the point raised above.

Practical recommendations on data collection

6.70 Many of the suggestions for data collection additions or refinements described above can be realised through combining the existing PC16 data with an asset register for roads. Many countries have progressed down this route to a considerable extent already and indeed Ireland has been exploring some aspects of incident location mapping within the NRA and the RSA. At present however the level of detail associated with each section of road is quite limited and would need to be refined in order to support more meaningful contributory factor analysis.

6.71 We are aware that there is a pavements asset register being developed for operations purposes within the NRA. There is an opportunity at this stage to influence the design of this asset register and the NRA should explore whether or not it will include the following attributes in its specification, as a minimum:

- density of roadside furniture
- roadside characteristics (e.g. verge width, vegetation)
- number of lanes
- road width
- speed limit
- existence of safety measures (e.g.median barriers, median road markings)
- line of sight distance
- road curvature
- road gradient

6.72 Linking the PC16 with the vehicle registration database would eliminate the need for a number of vehicle related data fields records. Linking it to the driver licence database would provide better insight into the age demographics associated with road collisions. The extent to which either of these things are done in each country depends to a large extent on their attitude

towards personal data protection. The NRA and the RSA should explore this issue with appropriate stakeholders.

7 COMMENTARY ON ROAD SAFETY STRATEGY

7.1 Here we discuss what we mean by 'strategy' and how this should translate into action.

7.2 All road safety strategies address the well known areas of:

- Education
- Enforcement
- Engineering

7.3 In addition, it is becoming increasingly important to include 'Evaluation' to this list to ensure that it is built into the implementation of the strategy, rather than considered 'after the event'. This was the case for the 2007-2012 road safety strategy and it is very important that this is sustained going forward so that the emerging benefits from particular forms or mixes of intervention can be measured and the implications for future activities assessed. This will be needed to fulfil the road safety impact assessment requirements of the EC Directive (2008/96/EC) on road infrastructure safety management.

7.4 A **'strategy'** can take different forms and it is often articulated in different ways by different countries and organisations. We subscribe to the following simple hierarchical approach:

- **Vision** – this articulates the overall aspiration. In this case it should relate Ireland's future road safety performance to what it is today and where it wants to be in comparison to road safety performance in other countries.
- **Objectives** – these translate the vision into measurable performance indicators and may include targets for these going forward in time.
- **Strategy** – this should describe the direction of travel for how the vision and objectives will be realised. It may consider several different strategic options that are available and describe how these have been assessed in order to determine what the appropriate strategy is.
- **Action Plan** – translates the strategy into SMART (Specific, Measurable, Attainable, Relevant and Timed) initiatives, activities or projects.

7.5 As far as the NRA is concerned, there are several different strategies that have been adopted in the past, each of which has had a contribution to make in improving road safety performance on Ireland's national road network. These are:

- cluster management
- network management
- area management.

7.6 **Collision cluster management** is well understood and involves identification of locations where road collision frequencies are greater than the national average. It is a matter of judgement the time window over which such assessments are made. Projects progressed under this approach tend to be reactive and short-term.

7.7 **Network management** involves looking for specific road features or characteristics across the whole network that appears to be associated with a disproportionate proportion of road

collisions or injury severities. This involves undertaking detailed road collision contributory factor analysis. This approach is likely to be associated with a programme of projects that will be implemented over an extended period, e.g. a programme of **'forgiving roads**' or **'self-explaining roads'** projects.

7.8 **Area management** involves a more holistic approach to road safety, focusing on an area or particular route.

Which strategy?

7.9 Looking forward, the questions are:

- **What is the right balance to be struck between each of these approaches?**
- **What are the associated data collection implications?**

7.10 On the basis of current knowledge and experience from other countries, it is not at all obvious which of these alternative strategic approaches will realise the greatest road safety risk returns nor if they should be treated as mutually exclusive. Consequently we believe that all three should be adopted in some way and that evaluation of the benefits from any initiatives or projects progressed under each strategic approach is evaluated.

7.11 **Cluster management** will continue as the EC Directive puts an obligation on national road authorities to ensure that they undertake three yearly reviews of road collision hot spots. However, like experience elsewhere in Europe, it is likely that these will become increasingly difficult to identify as they have been successfully addressed already.

7.12 The EC Directive (2008/96/EC) on road infrastructure safety management places an obligation on the NRA to tackle **Network Management** directly. Network safety ranking will need to be undertaken every three years. In addition there is a requirement for Road Safety Inspections (RSI) to ensure that road safety is managed proactively. This will be realised by identifying road characteristics or roadside attributes that are unforgiving for example. Our companion report on road collision contributory factors report identifies key road attributes that in combination tend to result in higher severity road collisions. The RSIs can be used to identify the location of such attribute combinations so that addressing them can be planned at a network level.

7.13 Adopting an **Area Management** demands engagement with, and involvement of, key stakeholders who will have a bearing on the likelihood of success at area level. These will include not only the NR, but also LAs, the Garda, and possibly schools. Area led initiatives will involve a mixture of initiatives for implementation on national and non-national roads. This is an example of a strategic approach that would be supported fully by a refreshed and rejuvenated Collision Prevention Programme.

7.14 In addition to the thinking described above, the NRA have implemented changes to standards in the Design Manual for Roads and Bridges (DMRB) to address the requirements of the EC Directive. Compliance with this will drive much of the work going forward.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 In this section we discuss the findings of this benchmark exercise in the context of: the data collection processes in Ireland; the level of detail that is collected; and how the data is analysed.

Road safety strategy

8.2 A separate report[54] on the results from a detailed assessment of road collision contributory factors has been published. This report identifies the main contributors to road collisions in Ireland and therefore provides a pointer as to what data should be collected to improve knowledge in this area.

8.3 The EC Directive (2008/96/EC) on road infrastructure safety management will require the NRA to implement a series of activities that will have a direct bearing on future road safety strategy. These include:

- the need to collect data to inform road safety impact assessments
- the need to undertake road safety audits on all infrastructure projects
- the need to continue to identify road collision hot spots and assess network safety ranking on a three year rolling basis
- the need to implement a programme of road safety inspections.

8.4 The NRA has undertaken a review of its historical approach to these matters and has implemented various changes to the way it delivers road safety management in order to comply with the EC Directive. For example, changes to the DMRB have been implemented and a programme of RSIs was initiated earlier this year.

R1. The NRA should continue to deliver road safety management through a mix of strategic approaches to engineering interventions to include: collision cluster analysis; network management and area management, and the results of on-going evaluations used to inform the future balance of these approaches.

8.5 Many of the recommendations suggested here will demand a co-ordinated approach across a range of organisations. Previously this was addressed through the Collision Working Group but this was not established on a formal basis and so was not effective.

R2. The Collision Working Group should be reinstated as a decision making and progress monitoring body to support delivery of the Road Safety Strategy. As a minimum it should have representatives from DTTAS, the RSA, the NRA and An Garda Síochána. As part of this process, a clear set of Terms of Reference should be developed.

Road collision data collection and analysis

Data collection processes

8.6 In general we can say that the Garda process for collecting road collision data in Ireland is in line with current good practice in police forces elsewhere in the European Community. Many of the weaknesses experienced in Ireland are shared with the experiences in other countries. Best practice is moving towards an IT based, on-site data collection system that is drop-down menu driven and which is automatically linked to the national road collision database. This is a relatively expensive option however, and there would be a long lead time between agreeing this as a way forward, developing a specification for the system and implementing it.

[54] Contributory factors analysis for road traffic collisions, Final, Risk Solutions, September 2012

8.7 The quality of the Garda PC16 returns is often compromised by poor location information and inconsistencies between the completed fields in the form. There is a proposal on the table for development of the PULSE system to encourage more consistent reporting of certain fields (e.g. through more drop-down menus) and to ensure more self consistency between fields.

R3. NRA should work in collaboration with the RSA and the Garda to ensure that the proposal for PULSE development is funded, approved and progressed.

8.8 The Garda has been evaluating the use of Tetra radios that are GPS enabled. With proper training and familiarity, these could be used to provide more accurate road collision information on the PC16 forms. We have not been able to determine the rollout and implementation plans for deployment of the Tetra radios.

R4. The Garda should be encouraged to rollout deployment of Tetra radios.

8.9 A significant problem related to the quality of the PC16 returns is that it can take 18 months for the records to be validated and approved for issue to the NRA and the relevant LA. With an appropriate high level agreement between the RSA and the NRA there is no obstacle to the release of unvalidated road collision data in a timelier manner. This can be used to identify the emergence of problem issues or collision clusters much more readily than the current process. In our companion report on Contributory Factors data analysis we suggested that the NRA receive un-validated data downloads from PULSE every six months, on the understanding that the 'official' dataset would still be provided by RSA some time later after the completion of their data validation checks.

R5. The RSA, the Garda and the NRA should work together and agree a protocol for release of unvalidated PC16 road collision data for research purposes.

8.10 The LAs performance with respect to returning LA16 forms is mixed. The level of success is influenced by the level of engagement and communication between the Garda and the LA as well as commitment at the LA level. In County Kerry the LA has given the responsibility for adhering to the LA16 process to one of its risk managers (who has previous experience as a Road Engineer). This is in recognition of the fact that insurance claims associated with road related incidents, has been increasing. This individual has established good relationships with the Garda at District level and has an excellent record of timely delivery of LA16 forms to the NRA.

R6. The NRA should work with County Kerry to evaluate the business case for employing a competent person to progress the LA16 process.

R7. The NRA should write up a good practice case study on the County Kerry experience and share it with other LAs.

8.11 In recognition of the fact that police road collision data records are weak with respect to identifying root causes and contributory factors, several countries have established road accident investigation teams. The remit of these teams is to capture much more detail about the root causes and contributory factors associated with road collisions. It is a large resource commitment, in Norway and Sweden the investigations are led by the regional groups of the national road authority and all fatal collisions are investigated. In Germany and the UK the investigation teams are outsourced and investigate a selection of road collision (fatal and non-fatal) in specific geographic locations. In Germany the investigation team (who operate a shift-based system) consists of four people. In the UK, the initiative costs approximately €1m per year.

8.12 We believe that some simple changes to the way the LA16 form is completed could improve the NRA's ability to perform contributory factors analysis. In the companion Contributory Factors Analysis report we recommended that Local Authority engineers should discuss the possible contributory factors to the road collision jointly with the attending Garda, and that the outcomes from these discussions are recorded in the LA16 form. This would add a lot of potentially valuable insight without necessarily requiring the LA Engineers to attribute the cause in a definitive way.

R8. The NRA should encourage LA engineers to discuss possible road collision contributory factors jointly with the Garda and to record the nature of these discussions on the LA16 forms.

8.13 The LA16 process is, in practice only applied to fatal road collisions. The original intent was to address both fatal as well as serious road collisions. The original intent shoud be encouraged.

R9. The LA16 process should be applied to both serious as well as fatal road collisions.

Level of detail in data collected

8.14 In general, the level of detail collected in Ireland for road collisions is in line with best practice elsewhere. With the exception of the planned upgrades to the PC16/PULSE system described above we do not recommend changes to the content of the PC16 form. Where we have identified potential areas where the data collected could be strengthened, the optimal route to realising this is by linking the road collision data up to other databases.

8.15 In most countries, road collision data is being linked to GIS based databases for road collision location mapping purposes. In Ireland there has been some work undertaken by the NRA, the HSE and LGCSB that has involved linking road collision data to other data sources. There is a need to formalise the GIS strategies being adopted by the various Government Agencies going forward.

R10. The NRA should evaluate the ease and effectiveness of the methods for joining up databases that have been used elsewhere within Ireland to determine whether they can be adapted for NRA's future needs. In particular, methods for geospatial linking of road collision location with other data should be explored.

8.16 In addition to this some countries are linking road data to road asset registers which helps to validate police road collision data and also to support root cause and contributory factor data analysis. We note that there are plans within the NRA to develop a pavements asset register for maintenance purposes. There is therefore an opportunity to realise more value from this asset register by influencing the specification.

R11. The NRA should look at the broader value that can be realised from a pavements asset register (i.e. how it can be used to inform decision making in areas other than maintenance needs and priorities) and should consult internally on how best to realise this value.

8.17 In Sweden and the Netherlands road collision data from the police is combined with medical records to enable underreporting of road accident collisions (especially to vulnerable road user groups such as cyclists) to be improved, and also to validate the severity of any injuries experienced by people involved in the road collision.

R12. The RSA and NRA should work with the Health Service Executive to establish whether or not the data collected in HIPE can be developed so that individuals can be identified and linked to road collision data, and how to enable this data to be released for research purposes.

8.18 There are potentially significant benefits that can be realised by combining road collision data with vehicle registration and driver's licensing data. The level of concern about data confidentiality issues around this is not consistent within the countries we looked at. The NRA should therefore maintain pressure of the DTTAS to establish whether or not this is something that should be pushed harder at Departmental level.

R13. The RSA and NRA should maintain a dialogue with appropriate stakeholders on the feasibility of being allowed to progress linking road collision data to vehicle registration and driver's licensing data through PULSE.

Data analysis

8.19 At present the NRA and the LAs undertake separate and independent analyses of the road collision data. There is no mechanism for LAs to share information and evaluate trends and

common solutions. In addition the Garda undertake an independent assessment of the data for their own purposes. This seems to be a relatively inefficient way to go about setting priorities and will be less effective than a more coherent and joined-up approach to setting road safety priorities.

8.20 The Collision Prevention Programme (CPP) was an ideal vehicle for ensuring that local knowledge about road safety issues are shared at a local level. The initiative fell into disrepute through lack of continuous support and resources. A reasonable estimate for the effort levels required at District team level to kick start this again would be 0.5 days each per month for a Garda officer and a Local Authority engineer. At the national level one meeting every six months should be enough demanding about 3 mandays per year for each attendee at the national level CPP.

R14. The RSA, the NRA, the Garda and LAs should get together in a formal forum to discuss and agree national road safety strategies. At a national level this can be realised through a reinvigoration and reinforcement of the Collision Prevention Programme (CPP).

R15. The re-establishment of the CPP Traffic Safety Teams as a mechanism for sharing knowledge at a local level should be pursued as a matter of high priority. This will require An Garda Síochána and the LAs to demonstrate some commitment and leadership.

8.21 There is clearly a level of expertise in road collision data analysis within the NRA although this is not being exploited for the benefit of all road authorities in Ireland. With an additional resource of two or three full time equivalent (FTE) staff, the current team could develop this expertise to provide a national road collision analysis resource. This would help ensure that LAs are using the same tools to support their road safety decision making which will encourage consistency and overall best value for money. The LAs would welcome this support so long as they were still given flexibility in determining the best solutions for particular road safety priorities. Provision of this type of support to LAs would demonstrate a valuable service and as a result they may be more prepared to engage with the LA16 process.

R16. The NRA should consider becoming the national road collision analysis centre of excellence. In this role it would advise DTTAS, RSA and the NRA on national road safety priorities as well as how these national priorities should be reflected at LA level. The intention would be to ensure that road safety priorities are evidenced from the national safety performance and that the NRA can provide advice of the road safety priorities at LA level, without prescribing how this should be addressed.

8.22 Recommendations 2, 3, 9, 10, 14, 15, and 16 will all require funding and resources to be deployed in order to make them happen. The RSA should consider the implications of this in developing the next Road Safety Strategy.

APPENDIX 1 – STATS19 FORM FOR ROAD COLLISION DATA COLLECTION IN THE UK

Sept. 2004

MG NSRF/A

ACCIDENT STATISTICS

Incident URN

Other ref.

1.3 ACCIDENT REFERENCE

*FATAL / SERIOUS / SLIGHT

1.9 TIME H H M M DAY* Su M T W Th F S 1.7 DATE D D M M 2 0 Y Y

1st Road Class & No. or (Unclassified - UC) (Not Known - NK)

1st Road Name

Outside House No. or Name or Marker Post No.

at junction with / or metres N S E W * of

2nd Road Class & No. or (Unclassified - UC) (Not Known - NK)

2nd Road Name

Town

Sector /Beat No.

County or Borough

Parish No. or Name

1.10 **Local Auth No. (if known)**

1.11 **Grid Reference** E N

REPORTING OFFICER Name Number

BCU/Stn 1.2 Force Tel Number

1.5 Number of vehicles	
1.6 Number of casualties	

1.14 ROAD TYPE

		✗
Roundabout	1	
One way street	2	
Dual carriageway	3	
Single carriageway	6	
Slip road	7	
Unknown	9	

1.15 Speed Limit (Permanent)

1.16 JUNCTION DETAIL

		✗
Not at or within 20 metres of junction	00	
Roundabout	01	
Mini roundabout	02	
T or staggered junction	03	
Slip road	05	
Crossroads	06	
Multiple junction	07	
Using private drive or entrance	08	
Other junction	09	

JUNCTION ACCIDENTS ONLY

1.17 JUNCTION CONTROL

		✗
Authorised person	1	
Automatic traffic signal	2	
Stop sign	3	
Give way or uncontrolled	4	

1.20a PEDESTRIAN CROSSING - HUMAN CONTROL

		✗
None within 50 metres	0	
Control by school crossing patrol	1	
Control by other authorised person	2	

1.20b PEDESTRIAN CROSSING - PHYSICAL FACILITIES

		✗
No physical crossing facility within 50m	0	
Zebra crossing	1	
Pelican, puffin, toucan or similar non-junction pedestrian light crossing	4	
Pedestrian phase at traffic signal junction	5	
Footbridge or subway	7	
Central refuge — no other controls	8	

1.22 WEATHER

		✗
Fine without high winds	1	
Raining without high winds	2	
Snowing without high winds	3	
Fine with high winds	4	
Raining with high winds	5	
Snowing with high winds	6	
Fog or mist — if hazard	7	
Other	8	
Unknown	9	

1.23 ROAD SURFACE CONDITION

		✗
Dry	1	
Wet / Damp	2	
Snow	3	
Frost / Ice	4	
Flood (surface water over 3cm deep)	5	

1.21 LIGHT CONDITIONS

		✗
Daylight: street lights present	1	
Daylight: no street lighting	2	
Daylight: street lighting unknown	3	
Darkness: street lights present and lit	4	
Darkness: street lights present but unlit	5	
Darkness: no street lighting	6	
Darkness: street lighting unknown	7	

1.24 SPECIAL CONDITIONS AT SITE

		✗
None	0	
Auto traffic signal out	1	
Auto traffic signal partially defective	2	
Permanent road signing or marking defective or obscured	3	
Roadworks	4	
Road surface defective	5	
Oil or diesel	6	
Mud	7	

1.25 CARRIAGEWAY HAZARDS

		✗
None	0	
Dislodged vehicle load in carriageway	1	
Other object in carriageway	2	
Involvement with previous accident	3	
Pedestrian in carriageway - not injured	6	
Any animal in carriageway (except ridden horse)	7	

1.26 Did a police officer attend the scene and obtain the details for this report?

		✗
Yes	1	
No	2	

Subject to local directions, boxes with a grey background need not be completed if already recorded

*** Circle as appropriate**

UNCLASSIFIED

APPENDIX 2 – BENCHMARKING OF ROAD COLLISION DATA COLLECTED IN SELECTED COUNTRIES

Version Note: Following QA checks, there are some minor revisions to these charts compared to the Interim Report

Summary of road collision data coverage

Complete ‘raw’ summary table

Comparison of Basic Data Collected In Relation To (Serious) Road Collisions in Various Countries v1.0

Comparison Summary Showing Coverage (number of matched fields) covered by each nation / dataset

Core Data Filter Status: Off

CD Filter removes a list of "reference" information from the comparison

Special Cases

	Generic		UK	IRE	IRE (LA)	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
	Master List		United Kingdom	Ireland	Ireland	Netherlands	Hungary	Italy	Germany	Spain	Lithuania	Malta	Joint	Joint	Netherlands
GENERIC SECTION	Total		STATS 19 (2005)	PULSE (PC16 Form)	Local Auth LA16 Form	Police RTA Form (1992)	Form 1009/04	ISTAT (Undated)	From DeSTATIS	Undated (Safetynet)	Undated (Safetynet)	Police Form (Undated)	CARE / CADaS 2011	FARS 2011	Inc. Linked Data Sources
0) INCIDENT REFERENCE INFORMATION	32		10	17	11	19	10	8	16	11	13	6	8	18	23
1) CIRCUMSTANCES	36		16	15	13	17	16	9	13	19	9	10	16	15	29
2) VEHICLES	84		25	41	8	33	19	25	24	29	15	16	20	59	61
3) PEOPLE	49		18	26	3	33	17	13	8	8	15	12	14	22	36
4) CONTRIBUTORY FACTORS	23		15	12	1	2	3	2	3	8	3	2	2	17	3
TOTAL GENERIC FACTORS COVERED	224		84	111	36	104	65	57	64	75	55	46	60	131	152
% GENERIC FACTORS COVERED	100%		38%	50%	16%	46%	29%	25%	29%	33%	25%	21%	27%	58%	68%

Filtered ‘core data’ table

Comparison of Basic Data Collected In Relation To (Serious) Road Collisions in Various Countries v1.0

Comparison Summary Showing Coverage (number of matched fields) covered by each nation / dataset Core Data Filter Status **On** Special Cases

CD Filter removes a list of "reference" information from the comparison

	Generic Master List		UK United Kingdom	IRE Ireland	IRE (LA) Ireland	NL Netherlands	HU Hungary	IT Italy	DE Germany	ES Spain	LT Lithuania	MT Malta	EU Joint	USA Joint	NL+ Netherlands
GENERIC SECTION	Total		STATS 19 (2005)	PULSE (PC16 Form)	Local Auth LA16 Form	Police RTA Form (1992)	Form 1009/04	ISTAT (Undated)	From DeSTATIS	Undated (Safetynet)	Undated (Safetynet)	Police Form (Undated)	CARE / CADaS 2011	FARS 2011	Inc. Linked Data Sources
0) INCIDENT REFERENCE INFORMATION	32		8	16	10	17	9	5	14	10	12	5	7	17	21
1) CIRCUMSTANCES	36		16	15	13	17	16	9	13	19	9	10	16	15	29
2) VEHICLES	84		20	30	5	30	16	22	22	25	10	13	16	53	52
3) PEOPLE	49		13	13		20	14	9	8	8	9	8	11	18	23
4) CONTRIBUTORY FACTORS	23		14	8		1	1	2	3	8	1	2	2	17	2
TOTAL GENERIC FACTORS COVERED	224		71	82	28	85	56	47	60	70	41	38	52	120	127
% GENERIC FACTORS COVERED	100%		32%	37%	13%	38%	25%	21%	27%	31%	18%	17%	23%	54%	57%

Generic Data Field Coverage

Comparison of Basic Data Collected In Relation To (Serious) Road Collisions in Various Countries v1.0

Comparison is made from all nations vs. generic master set of fields on basis of apparently equivalent data content

Gen Sect	Ref	Generic Variable Name	ORIGIN	ORIGIN REF	Original Variable Name	Core Dat	UK	IRE	IRE (LA	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
							United Kingdom	Ireland	Ireland	Netherlands	Hungary	Italy	Germany	Spain	Lithuania	Malta	Joint	Joint	Netherlands
		Bar length indicates the proportion of systems including the variable or a near equivalent, as judged in this assessment. (NOT INCLUDING NL+)					STATS 19 (2005)	PULSE (PC16 Form)	Local Auth LA16 Form	Police RTA Form (1992)	Form 1009/04	ISTAT (Undated)	From DeSTATIS	Undated (Safetynet)	Undated (Safetynet)	Police Form (Undated)	CARE / CADaS 2011	FARS 2011	Inc. Linked Data Sources
		Coverage					32	10	17	11	19	10	8	16	11	13	6	8	18	23
		0) INCIDENT REFERENCE INFORMATION																		
	0A	RECORD TYPE (NEW/UPDATE)	UK	1-1	RECORD TYPE	-	✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗
	0B	LOCAL / ATTENDING POLICE FORCE UNIT	UK	1-2	POLICE FORCE	CD	✓	✓	✓	✓	✗	✗	✓	✗	✓	✓	✗	✓	✓
	0C	INCIDENT ID (UNIQUE)	UK	1-3	ACCIDENT REFERENCE	-	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓
	0D	NUMBER OF VEHICLES RECORDED	UK	1-5	NUMBER OF VEHICLE RECORDS	CD	✓	✓	✗	✓	✓	✗	✓	✓	✓	✗	✗	✓	✓
	0E	NUMBER OF CASUALTIES RECORDED	UK	1-6	NUMBER OF CASUALTY RECORDS	CD	✓	✓	✗	✓	✓	✗	✓	✓	✓	✗	✗	✓	✓
	0F	DATE OF INCIDENT	UK	1-7	DATE	CD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	0G	TIME OF INCIDENT	UK	1-9	TIME	CD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	0H	LOCAL AUTHORITY	UK	1-10	LOCAL AUTHORITY	CD	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓
	0I	LOCATION (EASTING/LONGITUDE)	UK	1-11	LOCATION (Grid Ref)	CD	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓
	0J	LOCATION (NORTHING/LATTITUDE)	UK	1-11	LOCATION (Grid Ref)	CD	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓
	0K	INCIDENT CATEGORY (WIDER THAN TRAFFIC)	IRE		Category	CD	✗	✓	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗
	0L	INCIDENT TYPE (SUB-CATEGORY)	IRE		Type	CD	✗	✓	✗	✗	✗	✗	✓	✗	✓	✗	✗	✗	✗
	0M	DATE REPORTED TO POLICE OR OTHER EMERGENCY SERVICES	IRE		Reported Date	CD	✗	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓
	0N	TIME REPORTED TO POLICE OR OTHER EMERGENCY SERVICES	IRE		Reported Time	CD	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	0O	DATE OF DETECTION (IF NOT REPORTED)	IRE		Detected Date	CD	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	0P	CONTRIBUTORY FACTOR (HIGH LEVEL)	IRE		Contrib Factor	CD	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	0Q	INCIDENT DESCRIPTION	IRE		Narrative	CD	✗	✓	✓	✓	✗	✗	✓	✗	✓	✗	✗	✓	✓
	0R	RELATIVE LOCATION (FROM DEFINED JUNCT / MARKER)	IRE		ACCIDENT LOCATION	CD	✗	✓	✗	✓	✓	✗	✗	✓	✓	✓	✗	✓	✓
	0S	INCIDENT SEVERITY (WORST INJURY)	IRE		ACCIDENT TYPE	CD	✗	✓	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗	✓
	0T	ROAD ENVIRONMENT (URBAN / RURAL)	IRE (LA16)		ROAD ENVIRONS	CD	✗	✗	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓
	0U	OUT OF COURT SETTLEMENT	NL		Out of court settlement	CD	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	0V	ROAD AUTHORITY	NL		Road Authority	CD	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✓	✓
	0W	DAY OF THE WEEK	HU		Day of the week	CD	✗	✗	✗	✓	✓	✗	✓	✓	✓	✗	✗	✗	✓
	0X	COLLISION INTERACTION TYPE	Misc		COLLISION INTERACTION TYPE	CD	✗	✗	✗	✓	✗	✗	✓	✗	✗	✗	✓	✓	✓
	0Y	EMERGENCY MEDICAL SERVICE NOTIFIED	USA		C28 NOTIFICATION TIME EMS	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	0Y	EMERGENCY MEDICAL SERVICE ARRIVAL TIME AT SCENE	USA		C29 ARRIVAL TIME EMS	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	0Z	EMERGENCY MEDICAL SERVICE ARRIVAL TIME AT HOSPITAL	USA		C30 EMS TIME AT HOSPITAL	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	0AA	SPECIAL JURISDICTION	USA	C16	SPECIAL JURISDICTION	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	0AB	REPORTING ORGANISATION	IT		ROAD ACCIDENT REPORT MADE	-	✗	✗	✗	✓	✗	✓	✓	✗	✗	✗	✗	✗	✓
	0AC	COORDINATING ORGANISATION	IT		COORDINATING ORGAN(isation)	-	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗
	0AD	NUMBER OF FATALITIES RECORDED	ES		TOTAL FATALITIES	CD	✗	✗	✗	✗	✗	✗	✓	✓	✓	✗	✗	✗	✓
	0AE	INHABITANTS OF LOCAL AUTHORITY / MUNCIPALITY	ES		INHABITANTS (Thousands)	CD	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✗	✓

0X is implied in several cases - i.e. Single Vehicle Accident, 2 Veh, Multi, Veh-Ped etc

Gen Sect	Ref	Generic Variable Name	ORIGIN	ORIGIN REF	Original Variable Name	Core Dat	UK	IRE	IRE (LA	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
							United Kingdom	Ireland	Ireland	Netherlands	Hungary	Italy	Germany	Spain	Lithuania	Malta	Joint	Joint	Netherlands
Bar length indicates the proportion of systems including the variable or a near equivalent, as judged in this assessment. (NOT INCLUDING NL+)							STATS 19 (2005)	PULSE (PC16 Form)	Local Auth LA16 Form	Police RTA Form (1992)	Form 1009/04	ISTAT (Undated)	From DeSTATIS	Undated (Safetynet)	Undated (Safetynet)	Police Form (Undated)	CARE / CADaS 2011	FARS 2011	Inc. Linked Data Sources
			Coverage																
1) CIRCUMSTANCES			36				16	15	13	17	16	9	13	19	9	10	16	15	29
	1A	1st ROAD CLASS	UK	1-12	1st ROAD CLASS	CD	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✓	✓	✓
	1A	1st ROAD NUMBER	UK	1-13	1st ROAD NUMBER	CD	✓	✓	✓	✓	✓	✓	✗	✓	✓	✗	✓	✓	✓
	1B	1st ROAD TYPE (Layout)	UK	1-14	ROAD TYPE	CD	✓	✓	✗	✓	✓	✓	✗	✓	✓	✗	✓	✓	✓
	1C	SPEED LIMIT (Permanent)	UK	1-16	SPEED LIMIT (permanent)	CD	✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✓	✓	✓
	1D	JUNCTION DETAIL	UK	1-16	JUNCTION DETAIL	CD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	1E	JUNCTION CONTROL	UK	1-17	JUNCTION CONTROL	CD	✓	✓	✗	✓	✓	✗	✓	✓	✗	✗	✓	✓	✓
	1F	2nd ROAD CLASS	UK	1-18	2nd ROAD CLASS	CD	✓	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	1G	2ND ROAD NUMBER	UK	1-19	2ND ROAD NUMBER	CD	✓	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓	✗	✓
	1H	PEDESTRIAN CROSSING - HUMAN CONTROL	UK	1-20a	PEDESTRIAN CROSSING - HUMAN	CD	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗
	1I	PEDESTRIAN CROSSING - PHYSICAL FACILITIES	UK	1-20b	PEDESTRIAN CROSSING -	CD	✓	✗	✗	✓	✓	✗	✓	✗	✗	✗	✗	✗	✓
	1J	LIGHT CONDITIONS	UK	1-21	LIGHT CONDITIONS	CD	✓	✓	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓
	1K	WEATHER CONDITIONS	UK	1-22	WEATHER CONDITIONS	CD	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	1L	ROAD SURFACE CONDITIONS	UK	1-23	ROAD SURFACE CONDITION	CD	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓
	1M	SPECIAL CONDITIONS AT SITE	UK	1-24	SPECIAL CONDITIONS AT SITE	CD	✓	✓	✗	✓	✗	✗	✓	✓	✗	✓	✓	✓	✓
	1N	CARRIAGEWAY HAZARDS	UK	1-25	CARRIAGEWAY HAZARDS	CD	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗
	1O	POLICE REPORT BASED ON ATTENDANCE	UK	1-26	DID A POLICE OFFICER ATTEND	CD	✓	✗	✗	✓	✗	✗	✓	✗	✗	✗	✗	✗	✓
	1P	ROAD CHARACTER (Bends, hills etc.)	IRE		ROAD CHARACTER	CD	✗	✓	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓	✓
	1Q	ROAD MARKINGS	IRE		ROAD MARKINGS	CD	✗	✓	✓	✗	✓	✗	✗	✗	✗	✗	✓	✗	✓
	1R	ROAD WIDTH	IRE/ES		ROAD WIDTH	CD	✗	✓	✓	✗	✗	✗	✗	✓	✗	✗	✗	✗	✓
	1S	SKETCH OF SCENE	IRE		SKETCH	CD	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	1T	WARNING SIGNS	IRE (LA16)		WARNING SIGNS	CD	✗	✗	✓	✗	✗	✓	✗	✓	✗	✓	✗	✗	✓
	1U	REGULATORY SIGNS	IRE (LA16)		REGULATORY SIGNS	CD	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	1V	DIRECTION SIGNS	IRE (LA16)		DIRECTION SIGNS	CD	✗	✗	✓	✗	✗	✗	✓	✓	✗	✗	✗	✗	✓
	1W	SIGHT DISTANCE L-R	IRE (LA16)		SIGHT DISTANCE L-R	CD	✗	✗	✓	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗
	1X	SIGHT DISTANCE AHEAD	IRE (LA16)		SIGHT DISTANCE AHEAD	CD	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	1Y	ROADSIDE CONDITIONS	IRE (LA16)		FORGIVING ROADSIDE /	CD	✗	✗	✓	✗	✗	✗	✗	✓	✗	✗	✓	✗	✓
	1Z	ROAD SURFACE MATERIAL	NL		CONSTRUCTION	CD	✗	✗	✗	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	1AA	INTENDED USERS	HU		ROAD CONFIGURATION	CD	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✗	✓
	1AB	NUMBER OF TRAFFIC LANES	HU		NUMBER OF TRAFFIC LANES	CD	✗	✗	✗	✗	✓	✗	✗	✗	✗	✓	✓	✓	✓
	1AC	ROAD SURFACE QUALITY	HU		QUALITY OF PAVEMENT	CD	✗	✗	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗	✓
	1AD	SCHOOL BUS RELATED	USA	C26	SCHOOL BUS RELATED	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	1AE	RAILWAY CROSSING	USA	C27	RAIL GRADE CROSSING	CD	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✓	✓
	1AF	LANE WIDTH	ES		LANE WIDTH	CD	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✓
	1AG	SAFETY RELATED ROAD DESIGN ELEMENTS	ES		SAFETY RELATED ELEMENTS	CD	✗	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✓
	1AH	TRAFFIC SIGN VISIBILITY	ES		TRAFFIC SIGN VISIBILITY	CD	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗
	1AI	TRAFFIC SITUATION AT TIME OF COLLISION	ES		TRAFFIC SITUATION	CD	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗

Gen Sect	Ref	Generic Variable Name	ORIGIN	ORIGIN REF	Original Variable Name	Core Dat	UK	IRE	IRE (LA	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
							United Kingdom	Ireland	Ireland	Netherlands	Hungary	Italy	Germany	Spain	Lithuania	Malta	Joint	Joint	Netherlands
		Bar length indicates the proportion of systems including the variable or a near equivalent, as judged in this assessment. **(NOT INCLUDING NL+)**					STATS 19 (2005)	PULSE (PC16 Form)	Local Auth LA16 Form	Police RTA Form (1992)	Form 1009/04	ISTAT (Undated)	From DeSTATIS	Undated (Safetynet)	Undated (Safetynet)	Police Form (Undated)	CARE / CADaS 2011	FARS 2011	Inc. Linked Data Sources
			Coverage				25	41	8	33	19	25	24	29	15	16	20	59	61
2) VEHICLES			84																
	2A	RECORD TYPE (NEW/UPDATE)	UK	2-1	RECORD TYPE	-	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	2A	POLICE FORCE	UK	2-2	POLICE FORCE	-	✓	✓	✓	✓	✗	✗	✗	✗	✓	✓	✗	✓	✓
	2B	INCIDENT ID (UNIQUE)	UK	2-3	ACCIDENT REFERENCE	-	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓
	2C	VEHICLE ID (UNIQUE WITHIN INCIDENT ID)	UK	2-4	VEHICLE REFERENCE NUMBER	-	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓
	2D	VEHICLE TYPE (CYCLE, PTW, CAR ETC.)	UK	2-5	TYPE OF VEHICLE	CD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	2E	TOWING AND ARTICULATION	UK	2-6	TOWING AND ARTICULATION	CD	✓	✗	✗	✗	✗	✓	✗	✓	✗	✗	✓	✓	✗
	2F	MANOEUVRES	UK	2-7	MANOEUVRES	CD	✓	✓	✓	✓	✓	✗	✗	✓	✗	✓	✗	✓	✓
	2G	VEHICLE MOVEMENT COMPASS POINT	UK	2-8	VEHICLE MOVEMENT COMPASS	CD	✓	✗	✓	✗	✓	✗	✗	✗	✗	✓	✗	✗	✗
	2H	VEHICLE LOCATION AT TIME OF ACCIDENT (MAIN CARRIAG	UK	2-9	VEHICLE LOCATION AT TIME OF	CD	✓	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✓	✓
	2I	JUNCTION LOCATION OF VEHICLE	UK	2-10	JUNCTION LOCATION OF VEHICLE	CD	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	2J	SKIDDING AND OVERTURNING	UK	2-11	SKIDDING AND OVERTURNING	CD	✓	✓	✗	✓	✓	✓	✗	✓	✗	✗	✗	✓	✓
	2K	HIT OBJECT IN CARRIAGEWAY	UK	2-12	HIT OBJECT IN CARRIAGEWAY	CD	✓	✗	✗	✓	✓	✓	✗	✗	✗	✗	✗	✓	✓
	2L	VEHICLE LEAVING CARRIAGEWAY	UK	2-13	VEHICLE LEAVING CARRIAGEWAY	CD	✓	✗	✓	✓	✗	✓	✗	✓	✗	✗	✗	✓	✓
	2M	FIRST OBJECT HIT OFF CARRIAGEWAY	UK	2-14	FIRST OBJECT HIT OFF	CD	✓	✓	✓	✓	✗	✓	✗	✓	✗	✗	✗	✓	✓
	2N	FIRST POINT OF IMPACT / COLLISION TYPE	UK	2-16	FIRST POINT OF IMPACT	CD	✓	✗	✗	✓	✗	✓	✗	✓	✓	✓	✗	✓	✓
	2O	FIRST CONTACT BETWEEN EACH VEHICLE	UK	2-17	FIRST CONTACT BETWEEN EACH	CD	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	2P	SEX OF DRIVER	UK	2-21	SEX OF DRIVER	CD	✓	✓	✗	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓
	2Q	AGE OF DRIVER	UK	2-22	AGE OF DRIVER	CD	✓	✓	✗	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓
	2R	BREATH TEST	UK	2-23	BREATH TEST	CD	✓	✓	✗	✓	✗	✓	✓	✗	✗	✗	✗	✓	✓
	2S	HIT AND RUN	UK	2-24	HIT AND RUN	CD	✓	✗	✗	✓	✗	✗	✓	✗	✓	✗	✗	✓	✓
	2T	DFT SPECIAL PROJECTS	UK	2-25	DfT SPECIAL PROJECTS	-	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	2U	VEHICLE REGISTRATION MARK	UK	2-26	VEHICLE REGISTRATION MARK	CD	✓	✓	✗	✓	✗	✓	✓	✓	✓	✗	✗	✓	✓
	2V	DRIVER HOME POSTCODE	UK	2-27	DRIVER HOME POSTCODE	CD	✓	✓	✗	✓	✗	✗	✗	✗	✓	✗	✗	✓	✓
	2W	FOREIGN REGISTRED VEHICLE	UK	2-28	FOREIGN REGISTRED VEHICLE	CD	✓	✓	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✓
	2X	JOURNEY PURPOSE	UK	2-29	JOURNEY PURPOSE OF DRIVER /	CD	✓	✗	✗	✗	✗	✗	✗	✓	✗	✗	✓	✓	✗
	2Y	VEH MAKE	IRE		Make	CD	✗	✓	✗	✗	✓	✗	✓	✓	✓	✗	✓	✓	✓
	2Z	VEH MODEL	IRE		Model	-	✗	✓	✗	✗	✓	✗	✓	✓	✓	✗	✓	✓	✓
	2AA	VEH COLOUR	IRE		Colour	-	✗	✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✓
	2AB	VEH DAMAGE	IRE		Damage	CD	✗	✓	✗	✓	✗	✓	✓	✗	✓	✗	✗	✓	✓
	2AC	VEH REG TYPE	IRE		Reg Type	CD	✗	✓	✗	✗	✓	✗	✓	✗	✗	✗	✗	✗	✓
	2AD	VEH VIN / CHASSIS No.	IRE		Chassis No	-	✗	✓	✗	✗	✗	✗	✗	✗	✓	✗	✗	✓	✓
	2AE	VEH VALUE	IRE		Value	-	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	2AF	VEH DESCRIPTION / BODY TYPE	IRE		Description	-	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✓
	2AG	VEH ENG TYPE	IRE		Eng Type	-	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2AH	VEH ENG NO	IRE		Eng No	-	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	2AI	VEH ENG SIZE	IRE		Eng Size	-	✗	✓	✗	✗	✗	✓	✓	✗	✗	✗	✓	✗	✓

(2) Vehicles . . . continued overleaf

Gen Sect	Ref	Generic Variable Name	ORIGIN	ORIGIN REF	Original Variable Name	Core Dat	UK	IRE	IRE (LA	NL	HU	IT	DE	ES	LT	MT	EU	USA
							United Kingdom	Ireland	Ireland	Netherlands	Hungary	Italy	Germany	Spain	Lithuania	Malta	Joint	Joint
		Bar length indicates the proportion of systems including the variable or a near equivalent, as judged in this assessment. (NOT INCLUDING NL+)					STATS 19 (2005)	PULSE (PC16 Form)	Local Auth LA16 Form	Police RTA Form (1992)	Form 1009/04	ISTAT (Undated)	From DeSTATIS	Undated (Safetynet)	Undated (Safetynet)	Police Form (Undated)	CARE / CADaS 2011	FARS 2011
	2AJ	GOODS LOADED (YES/NO)	IRE		IF GOODS LOADED	CD	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	2AK	VEH DOCUMENTS IN ORDER	IRE		DOCUMENTS IN ORDER	CD	✗	✓	✗	✗	✗	✓	✗	✓	✗	✓	✗	✓
	2AL	VEH DEFECTS	IRE		DEFECTS	CD	✗	✓	✗	✗	✗	✓	✗	✓	✓	✗	✗	✓
	2AM	VEH INSURED	IRE		VEHICLE INSURED	CD	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	2AO	VEH ENTERING OR EXITING SITE (FACTORY, FIELD ETC)	IRE		IF ENTERING/EXITING	CD	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗
	2AP	VEH DRIVER RESIDENT	IRE		DRIVER RESIDENT	CD	✗	✓	✗	✓	✓	✗	✓	✗	✗	✓	✗	✗
	2AQ	VEH DRIVER LICENCE	IRE		LICENCE	CD	✗	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✓
	2AR	VEH DRIVER INSURED	IRE		DRIVER INSURED	CD	✗	✓	✗	✓	✗	✗	✗	✓	✗	✓	✗	✗
	2AS	VEH DRIVER INS POLICY NO.	IRE		POLICY No.	CD	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗
	2AT	VEH DRIVER ALCOHOL / DRUGS TESTED AT SCENE	IRE		TESTED AT SCENE	CD	✗	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✓
	2AU	VEH DRIVER ALCOHOL / DRUGS RESULT AT SCENE	IRE		RESULT	CD	✗	✓	✗	✓	✓	✗	✓	✓	✗	✓	✓	✓
	2AV	VEH DRIVER ALCOHOL / DRUGS TESTED AT POLICE STATION	IRE		TESTED AT STATION	CD	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓	✓
	2AW	VEH DRIVER ALCOHOL / DRUGS RESULT AT POLICE STATION	IRE		RESULT	CD	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓	✓
	2AX	VEH DRIVER ALCOHOL / DRUGS TESTED AT HOSPITAL	IRE		TESTED AT HOSPITAL	CD	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓	✓
	2AY	VEH DRIVER ALCOHOL / DRUGS RESULT AT HOSPITAL	IRE		RESULT	CD	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓	✓
	2AZ	VEHICLE OWNER (IF NOT DRIVER)	NL		VEHICLE OWNER	CD	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗
	2BA	DRIVING EXPERIENCE LEVEL / FREQUENCY	HU		DRIVING EXPERIENCE (of one who	CD	✗	✗	✗	✓	✓	✓	✓	✗	✓	✗	✗	✗
	2BC	VEHICLE SPEED AT TIME OF ACCIDENT	HU		Vehicle Speed at time of accident (Q -	CD	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
	2BD	ACTIVE SAFETY EQUIPMENT	EU		ACTIVE SAFETY EQUIPMENT (e.g.	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	2BE	VEHICLE DRIVE SYSTEM	EU		Unsure whether this is Fuel type or	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✓
	2BF	VEHICLE AGE / REG YEAR	EU		VEHICLE AGE OR REGISTRATION	CD	✗	✓	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓
	2BG	VEHICLE REGISTERED OWNER	USA	V8	REGISTERED VEHICLE OWNER	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2BH	VEHICLE WEIGHT	USA	V17	GROSS VEHICLE WEIGHT	CD	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✗	✓
	2BI	VEHICLE CONFIGURATION (esp commercial classes)	USA	V18	VEHICLE CONFIGURATION	CD	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✓
	2BJ	CARGO BODY TYPE	USA	V19	CARGO BODY TYPE	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2BK	HAZARDOUS MATERIALS INVOVLEMENT	USA	V20	HAZARDOUS MATERIAL	CD	✗	✗	✗	✓	✓	✗	✓	✓	✗	✗	✗	✓
	2BL	BUS / SPECIAL VEHICLE	USA	V21	V21 BUS USE - V22 SPECIAL USE -	CD	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✓
	2BM	VEHICLE REMOVAL FROM SCENE	USA	V30	VEHICLE REMOVAL	CD	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✓
	2BN	SPECIAL / RELATED FACTORS	USA	V33	RELATED FACTORS	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2BO	FIRE OCCURRED	USA	V34	FIRE OCCURRENCE	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2BP	VEH NUMBER OF OCCUPANTS	USA	V4	NUMBER OF OCCUPANTS	CD	✗	✗	✗	✓	✗	✗	✓	✓	✗	✗	✗	✓
	2BQ	UNDER- / OVER-RIDING	USA	V25	UNDERIDING / OVERRIDING (other	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2BR	DRIVER HEIGHT	USA	D12	DRIVER HEIGHT	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2BS	DRIVER WEIGHT	USA	D13	DRIVER WEIGHT	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2BT	PREVIOUS CRASH RECORD	USA	D14	D14 PREVIOUS RECORDED	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2BU	PREVIOUS SUSPENSIONS	USA	D15	D15 PREVIOUS RECORDED	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2BV	PREVIOUS DWI CONVICTIONS	USA	D16	D16 PREVIOUS DWI CONVICTIONS	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2BW	PREVIOUS SPEEDING CONVICTIONS	USA	D17	D17 PREVIOUS SPEEDING	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2BX	PREVIOUS OTHER HARMFUL MV CONVICTIONS	USA	D18	D18 PREVIOUS OTHER HARMFUL	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2BY	RELEVANT PAST INCIDENT DATES	USA	D19	DATES OF FIRST / LAST CRASH /	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	2BZ	CHARGES MADE AGAINST DRIVER	USA	D21	VIOLATIONS CHARGED	CD	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✓
	2CA	PRE-EXISTING DRIVER CONDITION/ IMPAIRMENT	USA	D23	CONDITION (IMPAIRMENT) AT TIME	CD	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✓
	2CB	DATE OF LAST TECHNICAL / ROADWORTHINESS INSPECTION	IT		YEAR OF LAST TECHNICAL	CD	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗
	2CC	VEHICLE ODOMETER READING (Km / Miles)	IT		KM COVERED (IN THOUSANDS	CD	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗
	2CD	PROFESSIONAL DRIVER?	ES		PROFESSIONAL DRIVER (Y/N)	CD	✗	✗	✗	✗	✗	✓	✗	✓	✗	✗	✗	✗
	2CE	ANTICIPATED JOURNEY DISTANCE	ES		JOURNEY ANTICIPATED	CD	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗
	2CF	SPEEDING RELATED OFFICES (SPECIFICALLY)	ES		ALLEGED SPEEDING OFFENCES	CD	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗
	2CG	DRIVING TIME PRIOR TO COLLISION	ES		PERIODS OF DRIVING TIME	CD	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗

Gen Sect	Ref	Generic Variable Name	ORIGIN	ORIGIN REF	Original Variable Name	Core Dat	UK	IRE	IRE (LA	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
							United Kingdom	Ireland	Ireland	Netherlands	Hungary	Italy	Germany	Spain	Lithuania	Malta	Joint	Joint	Netherlands
	Bar length indicates the proportion of systems including the variable or a near equivalent, as judged in this assessment. (NOT INCLUDING NL+)						STATS 19 (2005)	PULSE (PC16 Form)	Local Auth LA16 Form	Police RTA Form (1992)	Form 1009/04	ISTAT (Undated)	From DeSTATIS	Undated (Safetynet)	Undated (Safetynet)	Police Form (Undated)	CARE / CADaS 2011	FARS 2011	Inc. Linked Data Sources
3) PEOPLE				49			18	26	3	33	17	13	8	8	15	12	14	22	36
	3A	RECORD TYPE (NEW/UPDATE)	UK	3-1	RECORD TYPE	-	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	3A	POLICE FORCE	UK	3-2	POLICE FORCE	-	✓	✓	✓	✓	✓	✗	✗	✗	✓	✓	✗	✓	✓
	3B	INCIDENT ID (UNIQUE)	UK	3-3	ACCIDENT REFERENCE	-	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓
	3C	VEHICLE ID (UNIQUE WITHIN INCIDENT ID)	UK	3-4	VEHICLE REFERENCE NUMBER	-	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓
	3D	PERSON ID (UNIQUE WITHIN INCIDENT ID)	UK	3-5	CASUALTY REFERENCE NUMBER	-	✓	✓	✗	✓	✗	✓	✗	✗	✓	✓	✓	✓	✓
	3E	PERSON ROLE (DRIVER, PASSENGER ETC)	UK	3-6	CASUALTY CLASS	CD	✓	✓	✗	✓	✗	✓	✓	✗	✓	✓	✓	✓	✓
	3F	SEX OF CASUALTY	UK	3-7	SEX OF CASUALTY	CD	✓	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓
	3G	AGE OF CASUALTY	UK	3-8	AGE OF CASUALTY	CD	✓	✓	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓
	3H	SEVERITY OF CASUALTY	UK	3-9	SEVERITY OF CASUALTY	CD	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	3I	PEDESTRIAN LOCATION	UK	3-10	PEDESTRIAN LOCATION	CD	✓	✗	✗	✓	✓	✗	✓	✓	✗	✗	✗	✓	✓
	3J	PEDESTRIAN MOVEMENT	UK	3-11	PEDESTRIAN MOVEMENT	CD	✓	✗	✗	✓	✓	✗	✗	✓	✗	✓	✗	✓	✓
	3K	PEDESTRIAN DIRECTION	UK	3-12	PEDESTRIAN DIRECTION	CD	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	3L	SCHOOL PUPIL CASUALTY	UK	3-13	SCHOOL PUPIL CASUALTY	CD	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
	3M	CAR PASSENGER	UK	3-15	CAR PASSENGER	CD	✓	✓	✗	✓	✓	✗	✓	✗	✗	✗	✗	✗	✓
	3N	BUS OR COACH PASSENGER	UK	3-16	BUS OR COACH PASSENGER	CD	✓	✗	✗	✓	✗	✗	✓	✗	✗	✗	✗	✗	✓
	3O	DFT SPECIAL PROJECTS	UK	3-17	DfT SPECIAL PROJECTS	CD	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	3P	CASUALTY HOME POSTCODE	UK	3-18	CASUALTY HOME POSTCODE	CD	✓	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	3Q	PEDEST'N INJURED IN COURSE OF 'ON THE ROAD' WORK	UK	3-19	PEDESTRIAN INJURED IN THE	CD	✓	✗	✗	✓	✗	✗	✓	✗	✗	✗	✗	✗	✓
	3R	ROLE IN INCIDENT	IRE		Role (May = Casualty Class)	CD	✗	✓	✗	✓	✓	✗	✗	✗	✗	✗	✗	✗	✓
	3S	SURNAME	IRE		Surname	-	✗	✓	✗	✓	✗	✗	✗	✗	✓	✗	✗	✗	✓
	3T	FORENAME	IRE		Forename	-	✗	✓	✗	✓	✗	✗	✗	✗	✓	✗	✗	✗	✓
	3U	MOTHERS NAME	IRE		Mothers name	-	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	3V	NICKNAME	IRE		Nickname	-	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	3W	TOURIST / NATIONALITY	IRE		Tourist OR Nationality Check	CD	✗	✓	✗	✓	✓	✗	✗	✗	✓	✗	✓	✗	✓
	3X	HOME TEL	IRE		Home Tel	-	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	3Y	WORK TEL	IRE		Work Tel	-	✗	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓
	3Z	MOBILE TEL	IRE		Mobile Tel	-	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	3AA	FAX	IRE		Fax	-	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	3AB	EMAIL	IRE		email	-	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
	3AC	ATTENDED HOSPITAL	IRE		TAKEN TO HOSPITAL	CD	✗	✓	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓	✓
	3AD	FAMILIAR WITH LOCATION	IRE		FAMILIAR LOCATION	CD	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	3AE	SEAT BELT WORN	IRE		SEAT BELT	CD	✗	✓	✗	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓
	3AF	LIGHTS (ON PERSON / CYCLE?)	IRE		LIGHT	CD	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓	✗	✓
	3AG	HI-VIS WORN	IRE		ARMBANDS etc	CD	✗	✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗
	3AH	CRASH HELMET WORN	HU		CRASH HELMET	CD	✗	✗	✗	✓	✓	✓	✗	✓	✗	✓	✓	✓	✓
	3AI	AIR BAG	HU		AIR BAG PRESENT / WORKING	CD	✗	✗	✗	✗	✓	✗	✗	✗	✓	✗	✓	✓	✗
	3AJ	CHILD SAFETY SEAT	HU		CHILD SAFETY SEAT	CD	✗	✗	✗	✓	✓	✗	✗	✓	✗	✗	✓	✓	✓
	3AK	SEATING POSITION IN VEHICLE	EU/USA		SEATING POSITION IN VEHICLE	CD	✗	✗	✗	✓	✗	✓	✗	✗	✗	✓	✓	✓	✓
	3AL	SIGNS OF MISUSE OF RESTRAINT / HELMET	USA	P11	ANY INDICATION OF MIS-USE OF	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✓
	3AM	EJECTION FROM VEHICLE	USA	P13	EJECTION	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	3AN	EJECTION PATH	USA	P14	EJECTION PATH	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	3AO	EXTRICATION FROM VEHICLE	USA	P15	EXTRICATION	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	3AP	DIED AT SCENE	USA	P23	DIED AT SCENE / EN-ROUTE	CD	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓	✓
	3AQ	DATE / TIME OF DEATH	USE	P24/25	DATE AND TIME OF DEATH	CD	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✓	✓
	3AR	SEAT BELT / HELMET COMPULSORY FOR VEH?	IT		COMPULSORY SEAT BELTS /	CD	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
	3AS	INJURY FROM HEAVY BRAKING / FALLING FROM VEHICLE	IT		(Part of) MOVING VEHICLE	CD	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗
	3AT	MAIN INJURY LOCATION ON BODY	ES		MOST SERIOUS INJURIES	CD	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗
	3AU	INVALID / PASSENGER WITH PRE-EXISTING IMPAIRMENT	LT		Invalid (Drvier of passenger)	CD	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗
	3AV	TRAUMA / MENTAL INJURY SEVERITY	LT		Trauma severity	CD	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗

Gen Sect	Ref	Generic Variable Name	ORIGIN	ORIGIN REF	Original Variable Name	Core Dat	UK	IRE	IRE (LA	NL	HU	IT	DE	ES	LT	MT	EU	USA	NL+
							United Kingdom	Ireland	Ireland	Netherlands	Hungary	Italy	Germany	Spain	Lithuania	Malta	Joint	Joint	Netherlands
	Bar length indicates the proportion of systems including the variable or a near equivalent, as judged in this assessment. (NOT INCLUDING NL+)						STATS 19 (2005)	PULSE (PC16 Form)	Local Auth LA16 Form	Police RTA Form (1992)	Form 1009/04	ISTAT (Undated)	From DeSTATIS	Undated (Safetynet)	Undated (Safetynet)	Police Form (Undated)	CARE / CADaS 2011	FARS 2011	Inc. Linked Data Sources
4) CONTRIBUTORY FACTORS			23				15	12	1	2	3	2	3	8	3	2	2	17	3
	4A	ROAD ENVIRONMENT	UK	4-1	ROAD ENVIRONMENT	CD	✓	✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✓	✗
	4A	VEHICLE DEFECTS	UK	4-2	VEHICLE DEFECTS	CD	✓	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✓	✗
	4B	INJUDICIOUS ACTION	UK	4-3	INJUDICIOUS ACTION	CD	✓	✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✓	✗
	4C	DRIVER/RIDER ERROR OR REACTION	UK	4-4	DRIVER/RIDER ERROR OR	CD	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	4D	IMPAIRMENT OR DISTRACTION: ALCOHOL, DRUGS, MEDICAL	UK	4-5	IMPAIRMENT OR DISTRACTION:	CD	✓	✗	✗	✗	✗	✓	✓	✓	✗	✓	✓	✓	✗
	4E	IMPAIRMENT OR DISTRACTION: MOBILE PHONE/DEVICE. IN VEH.	UK	4-5	IMPAIRMENT OR DISTRACTION:	CD	✓	✓	✗	✗	✗	✗	✗	✓	✗	✗	✓	✓	✗
	4F	BEHAVIOUR OR INEXPERIENCE	UK	4-6	BEHAVIOUR OR INEXPERIENCE	CD	✓	✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗
	4G	VISION AFFECTED BY	UK	4-7	VISION AFFECTED BY	CD	✓	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✓	✗
	4H	PEDESTRIAN ONLY (CASUALTY OR UNINJURED)	UK	4-8	PEDESTRIAN ONLY (CASUALTY OR	CD	✓	✗	✗	✗	✗	✗	✓	✓	✓	✗	✗	✓	✓
	4I	PEDESTRIAN IMPAIRMENT	UK	4-8	PEDESTRIAN IMPAIRMENT	CD	✓	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✓	✗
	4J	SPECIAL CODES	UK	4-9	SPECIAL CODES	CD	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	4K	DRIVER MANOUVRED TO AVOID	USA	PC15	DRIVER MANEUVERED TO AVOID	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	4L	PRE-IMPACT STABILITY	USA	PC21	PRE-IMPACT STABILITY	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	4M	PRE-IMPACT LOCATION	USA	PC22	PRE-IMPACT LOCATION	CD	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	4N	BASIS OF CF JUDGEMENT	IRE		GARDA OPINION	CD	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	4O	PRINCIPAL CAUSE IDENTIFIED (Yes/No)	IRE	CF	PRINCIPAL CAUSE	CD	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	4P	PRINCIPAL CAUSE (Indication)	IRE	CF	PRINCIPAL CAUSE	CD	✓	✓	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓	✗
	4Q	PRINCIPAL CAUSE (Degree)	IRE	CF	IF YES SPECIFY EXTENT	CD	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
	4R	INVESTIGATION RECOMMENDATIONS (Narrative)	IRE		MEMBERS RECOMMENDATION	-	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	4S	SUPERVISOR'S DECISION ON RECOMMENDATIONS (Narrative)	IRE		SUPERVISOR'S DECISION	-	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	4T	INVESTIGATING OFFICER SIGN-OFF AND ID	IRE	REP OFF	INVESTIGATING GARDA	-	✓	✓	✓	✓	✓	✗	✗	✗	✓	✗	✗	✗	✓
	4U	SUPERVISING OFFIVER SIGN-OFF AND ID	IRE		REVIEWED BY SUPERVISOR	-	✗	✓	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✗
	4V	SUDDEN ILLNESS	MA		SUDDEN ILLNESS	CD	✗	✗	✗	✓	✗	✗	✗	✗	✗	✓	✗	✗	✓