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International Review of Road Collision Investigation Approaches

Saul Jeavons and Adrian Runacres The Transafe Network Ltd December 2020

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Disclaimer

This report has been prepared for the RAC Foundation by Saul Jeavons and Adrian Runacres of The Transafe Network Ltd. Any errors or omissions are the author's sole responsibility. The report content reflects the views of the authors and not necessarily those of the RAC Foundation.

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Foreword

Back in my civil service days the question always posed whenever a new idea was put on the table was: "Is anywhere else in the world already doing this?" It's a good question – there's not much point in re-inventing the wheel if it's available to buy off the shelf. And international experience can provide lessons we can learn about what makes for successful implementation.

But the question – or at least the answer to it - has to be approached with some caution. Different countries adopt different policies for a whole range of reasons particular to them: societal, cultural and geographical to name but three. And it is through the prism of these variances that one must consider how well – and to what benefit – policies and practices seen overseas translate to our home environment. For that reason, we must also be conscious of the fact that just because a certain way of doing things is absent globally that does not mean it isn't right for these shores.

However, this report suggests that countries as geographically distant as Finland and New Zealand, and as different in scale as the USA and Malta, all see some merit in applying the same sort of dispassionate analytical rigour to road crashes as is routinely and historically the case in other areas of transport such as maritime, aviation and rail.

That still doesn't mean that what is happening overseas is immediately translatable to this country. We haven't found a simple blueprint we could copy. But it does suggest we are absolutely on the right lines to be exploring how best we could do more to learn more and so sharpen our strategies for making our roads safer for all.

Steve Gooding

HEAR

Director, RAC Foundation

Executive Summary

Concerns have been expressed that the current UK approach to road traffic collisions is inconsistent with that taken in regard of other transport modes, such as air, rail and marine, each of which have an independent, publicly funded 'investigation branch'. As a result, opportunities to learn from incidents on our roads and to use that knowledge to prevent future incidents might be lost.

In 2006, a report was published by the ROad Strategy for Accidents in Transport (RO-SAT) Working Group, funded by the European Commission (EC). The report considered that all levels of accident investigation (i.e. statistical, intermediate, in-depth and special cases) were essential elements of a road accident investigation system. Monclus *et al.* (2006) urged the European Commission:

"To encourage all Member States to devote the necessary resources to cover all levels of investigation by means of permanent, professionalized, and in case of in-depth studies also multidisciplinary, independent investigating bodies." (Monclus et al, 2006)

The report went on to recommend that in-depth, independent, multidisciplinary investigations should be a core ingredient of EU Member State road traffic safety policies.

Although there have been several developments across Europe, the situation in the UK with regard to investigating road collisions has not significantly altered since the RO-SAT report was published in 2006. It therefore appears there may be a critical gap in the feedback cycle from the investigation of individual collisions, through to the development of wider policies and strategies to reduce the incidence of collisions and mitigate their severity. The RAC Foundation Road Collision Investigation Project (RCIP) aims to establish whether there is a business case for putting more resources into the investigation of road collisions to bridge this gap, and if so, which formats might be most beneficial. RCIP therefore requires a clearer picture of how road collision investigations are handled in other countries and seeks to identify international best practice.

The purpose of this study is therefore to identify international road collision investigation functions and formats with relevant application to the UK context. The objectives are to select, describe and summarise the road collision investigation functions of several countries; to compare and categorise differences; and to recommend elements that are considered to be of potential relevance to the UK context and warrant further in-depth review by RCIP through qualitative interviews. The study was primarily conducted as a desk-based literature review but, through the international contacts of the Project Advisory Panel, further information relating to a number of organisations responsible for road traffic collision investigation has been obtained, and key points that may be of particular interest with regard to possible application for potential UK developments in this area have been identified. It is envisaged that, following the completion of this study report, the RCIP team may wish to follow-up with identified contacts and elements that are of interest to the UK by conducting in-depth, qualitative interviews. The review has highlighted several topics that may be of particular interest to RCIP which will require careful consideration in any development towards a national UK road traffic collision investigation body or similar. The review has also resulted in 13 recommendations being made in relation to the potential establishment of such a body in the UK. These recommendations encompass: the overall purpose of the organisation; its independence; legal powers; scope of activity; investigation types; operating practices; size and composition; and liaison with other enforcement and investigatory bodies.

Recommendation 1

It is recommended that the purpose of a UK RCIB includes the independent investigation of road traffic collisions and other incidents occurring on the UK road network in order to identify the causes of those incidents and the factors influencing their outcomes, as well as to make recommendations aimed at reducing the occurrence and severity of future incidents.

Recommendation 2

It is recommended that a UK RCIB should be established as an impartial investigator, independent from the existing judicial investigation process operated by the police.

Recommendation 3

To ensure that a UK RCIB can function effectively, sufficient legal powers are recommended.

Recommendation 4

In order to operate efficiently and maximise the potential for learning, it is recommended that a UK RCIB become a Member of the Accident Investigations Chiefs' Council (AICC), which would further relationships with the existing UK Accident Investigation Branches that deal with other transport modes, as well as liaising with international counterparts.

Recommendation 5

It is recommended that a UK RCIB undertakes multi-disciplinary investigations and is tasked with considering all relevant issues relating to the road environment, vehicle and human factors aspects of incidents and making recommendations relating to all of these aspects as appropriate.

Recommendation 6

The monitoring of progress and implementation of recommendations will be important to the success of any future UK RCIB in reducing future incidents. It is therefore recommended that consideration be given to potential mechanisms for achieving this monitoring and for identifying who would be responsible for this task

Recommendation 7

It is recommended that consideration be given to the question of whether recommendations made by a UK RCIB should be enforceable.

Recommendation 8

It is recommended that a UK RCIB: investigates 'major' incidents (i.e. of significant economic impact, as well as those involving injury and death), attends 'major' incident scenes as soon as practicable after the incident has occurred, undertakes other incident investigations at its discretion, consistent with its overall remit, and additionally undertakes thematic investigations;

Recommendation 9

It is recommended that a UK RCIB utilises and analyses statistical information and, for example, is granted full data access to the Department for Transport's Personal Injury Accident database (STATS19 data) and other relevant government data sources (e.g. all relevant police IT systems, coroners prevention of future death reports, etc.).

Recommendation 10

In addition to obtaining evidence directly from incident scenes and other organisations, it is considered important that a UK RCIB be provided with access to police road traffic collision files, including their reports, findings, notes, measurements, plans, test results and interview transcripts, etc.

Recommendation 11

A UK RCIB should be allowed to question investigating police officers and undertake additional investigations of incidents that may have already been 'closed' from a police/ judicial point of view.

Recommendation 12

It is recognised that there are different potential models for a UK RCIB that will have a significant effect on its required staffing levels and financial budget, and it is recommended that this issue is given careful consideration.

Recommendation 13

It is recommended that if a UK RCIB organisation is initially established as a relatively small organisation, it should have the potential to grow significantly in size as its role develops and as the other organisations with which it must liaise and co-operate adjust to its presence.

1. Introduction



Road collision investigation in the UK is a function carried out by the police. By law, it is required that all road traffic collisions resulting in personal injury are reported to the police and it is also common practice for the police to be notified of many damage-only road traffic collisions. Typically, unless these collisions have resulted in severe personal injuries, they are dealt with by roads policing officers or other officers as part of their everyday activities. All personal injury collisions dealt with by the police result in the completion of a standard statistical form (often referred to as a 'STATS19' form), which is then submitted to the Department for Transport (DfT) for processing and made available for later statistical analysis. The information concerning damage-only collisions is not processed in this way, and information on such collisions is only typically available for analysis through the records held by insurance companies.

Police forces across the country also operate specialist 'Forensic Road Collision Investigation Units', tasked with undertaking detailed investigations of those road traffic collisions that result in the most serious life changing or fatal injuries. The purpose of these detailed investigations is to identify the causes of such collisions. The reports prepared by these specialist police units are made available to coroners investigating the deaths of the people involved, as well as to other police officers and the Criminal Prosecution Service, who are tasked with identifying and prosecuting any unlawful activity associated with the collisions in question. In addition to UK police investigations, the DfT and other organisations periodically undertake individual road traffic collision research projects, such as the 'On The Spot' (OTS) project and the 'Road Accidents In-Depth Study' (RAIDS) programme. However, these projects have been neither nationally representative, nor as in depth as those undertaken by the investigation branches in other modes. For example, attached to these projects have been 'high interest/unique incidents' taskings, allowing the researchers to focus on specific incidents from which additional learning may be gained. However, with no legal powers or investigative authority, the scope of these has been extremely limited by comparison to a national investigation branch. The scope, methodology and timescale of such research projects varies widely, but the results are typically published and made available to technical and academic organisations interested in this field.

The current UK approach to road traffic collisions is somewhat inconsistent with the approaches taken in respect of other transport modes such as air, rail and marine. Each of these modes have an independent, publicly funded investigation branch tasked with undertaking detailed investigations of accidents and incidents to identify their causes and also to provide information and recommendations to industry and the relevant government enforcement organisations, so that appropriate lessons can be learned to improve safety. This is an area that has been subject to discussion and debate as well as previous research, including by the RCIP (e.g. RAC Foundation, 2018; Stanton, 2019; Barrow, 2019; Transport Safety Commission, 2015).

In 2004, the European Commission funded a group of experts to advise upon a strategy to deal with accidents in the transport sector. Working sub-groups for each transport mode were set up and, in 2006, a report was published by the Road Strategy for Accidents in Transport (RO-SAT) Working Group (Monclus *et al*, 2006). This document included 34 remarks, conclusions and recommendations issued both at national and EU levels. The RO-SAT Working Group acknowledged the co-existence of numerous national and international activities covering:

- statistical data collection;
- intermediate level investigations;
- in-depth investigations (independent as well as non-independent); and
- special accident investigations of events of particular interest or seriousness (e.g. a devastating fire in a road tunnel).

The RO-SAT Working Group considered that all accident investigation levels (statistical, intermediate, in-depth and special cases) were essential elements of a road accident investigation system, and urged the European Commission:

"To encourage all Member States to devote the necessary resources to cover all levels of investigation by means of permanent, professionalized, and in case of in-depth studies also multidisciplinary, independent investigating bodies." The RO-SAT Working Group acknowledged that statistical data collected by the police is sufficient for many of the more general aspects of safety and prevention work but that this is usually insufficient to allow for more in-depth analysis. Furthermore, the Working Group also recognised that, "*Neither the collection of statistics nor police or other intermediate-level investigations are enough to fully and deeply learn from accidents*", and went on to recommend that in-depth, independent multidisciplinary investigations should be a core ingredient of EU member state road traffic safety policies.

One particularly relevant recommendation was that police officers who undertake in-depth technical investigations of road traffic collisions should be independent from teams considering the potential prosecution of any individuals arising from the collisions. Additionally, provisions should be made to ensure that these investigating police officers are not obliged to inform the court of situations where they believe the law may have been violated as this could potentially preclude or undermine the independence of the investigation.

The 2006 RO-SAT report specifically noted that substantial progress had been achieved in the UK (and Finland) with the legal and organisational coordination and cooperation between police and prosecutor services in connection with independent accident investigation branches or bodies that had been set-up in relation to air, rail and marine transport modes, and went on to suggest these developments as potential models for the road transport sector.

The project team are aware that, since the publication of the RO-SAT report in 2006, there have been several developments across Europe, which are discussed further within this report. However, despite the length of time which has elapsed, the way in which road collisions are investigated in the UK has not significantly altered in that time. Therefore, when comparing the approach to accident investigation in the UK for other modes of transport, it appears there may be a critical gap in the feedback cycle in relation to road collisions, from the investigation of individual incidents through to the development of wider policies and strategies to both reduce the incidence of collisions and to mitigate the severity of those still happening.

1.1 Study Aims

The RAC Foundation Road Collision Investigation Project (RCIP) aims to establish whether there is a business case for putting more resources into the investigation of road collisions to bridge this gap, and if so, which formats might be most beneficial. RCIP therefore needs to have a clearer understanding of the road collision investigation methodologies and models operating in other countries, and to identify international best practice.

1.2 Study Objectives

The purpose of this study is therefore to identify international road collision investigation functions and formats with potential relevant application to the UK context, encompassing the following specific objectives:

- To select several countries with road collision investigation functions suitable for review.
- To describe the road collision investigation functions and formats of these countries.
- To summarise country level functions and formats in easy to digest case-study formats.
- To compare road collision investigation functions and formats identified, categorise differences and recommend elements for UK context consideration.
- To recommend the functions and formats uncovered that potentially warrant further in-depth review by RCIP.

The study was primarily conducted as a desk-based literature review. The information was obtained in relation to 31 different countries through the key international contacts of a Project Advisory Panel. A full list of these countries is included in Appendix A.

It is envisaged that, following the completion of this study report, the RCIP team may wish to follow-up elements of interest to the UK by conducting in-depth qualitative interviews with identified contacts.

2. Methodology



A small Project Advisory Panel was selected to address the study aims and objectives, with experience across:

- forensic collision investigation.
- highways risk management and investigation.
- forensic investigation of component failures and product recall (including vehicles).
- industrial collision investigation.
- cross modal investigations (road/rail interface, etc.).

This panel served two functions:

- 1. To utilise their network of international contacts to identify countries and organisations best placed to provide useful information regarding current collision investigation initiatives.
- 2. To critique the effectiveness of the arrangements in place.

The study was divided into three separate stages: identification of relevant international organisations; selection and analysis of comparator countries; and case studies and final report. Each of these is outlined in more detail below.

2.1 Stage 1 – Identification of relevant international organisations

A desktop study was undertaken to select previous relevant projects and reports in this field. This included consideration of the European ROad Strategy for Accidents in Transport Working Group Review Report (Monclus *et al*, 2006), providing information on road collision investigation methodologies employed at that time in comparator countries (including Sweden, Germany, France, Finland, The Netherlands and Norway), as well as other academic sources and internet searches. Information relating to historical situations was also investigated to ascertain whether any were still applicable.

The Project Advisory Panel also requested information from a wide range of international contacts in Australia, Austria, Bosnia-Herzegovina, Canada, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, India, Israel, Italy, Malaysia, the Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Sweden, Switzerland, Ukraine, the United Arab Emirates and the USA.

2.2 Stage 2 – Selection and analysis of comparator countries

Utilising the Stage 1 results, several jurisdictions with different road collision investigation functions were selected for review. Initial information relating to national organisations was, in some cases, also supplemented to include state level organisations within federal systems, such as the USA and Australia, to obtain a broader and more detailed understanding of potentially relevant and comparable initiatives.

These fell into 5 broad categories:

- comparator countries/states with relevant, established national/state level road collision investigation functions.
- countries/states with established, forensic, multi-disciplinary road collision investigation bodies.
- countries/states with established forensic, multi-modal transport incident investigation bodies.
- countries/states with organisations with non-forensic road collision investigation functions.
- countries/states with public or non-public bodies involved in thematic collision research studies and investigations.

The above information allowed the study team to produce a comparison matrix summarising the road collision investigation functions and formats of these countries, which is provided in Appendix A.

2.3 Stage 3 – Case Studies and Final Report

Utilising the results of Stage 2, the project team identified ten international organisations that were considered to warrant further discussion within the final report. These are presented as case studies and the country/state level functions of each system are summarised, including analyses of the respective scopes of investigation.

One example of the variation in investigation scopes that have been identified in this manner concerns the Multidisciplinary Accident Investigation Team (MAIT) system, operated by the California Highway Patrol, which only allows for the in-depth multidisciplinary investigation of individual incidents, but not thematic investigations. By contrast, other organisations are in a position to conduct a combination of these functions.

This report also includes a section discussing the findings of the case study analyses and provides recommendations relating to the system (or elements of different systems), functions and formats that might best be suited to consideration within a UK context, and can potentially be followed-up further by RCIP via qualitative interviews.

Unless otherwise stated, the information presented and discussed in this report was obtained through published information from the relevant organisations (including websites), responses to questionnaires issued as part of this study, or through direct personal communication between the project team and senior staff within the relevant organisations.

3. International Organisations



In order to obtain information concerning the road collision investigation practices in a range of countries, the Project Advisory Panel contacted their wide-ranging international contacts and requested that they complete a questionnaire. Returns were received from from 31 different organisations around the world.

Further contact was then made with a number of these organisations to gain more detailed information or further clarity where needed, regarding practices and arrangements of interest.

The matrix shown in Appendix A provides a summary of the principal findings from the completed questionnaires, with the questionnaire itself shown in Appendix B.

Police forces from all respondent countries have responsibility for dealing with and investigating road traffic collisions. However, these investigations tend to be focused on the potential for prosecuting individual road users, and most of those forces are not tasked with carrying out routine, in-depth investigations that are not directly linked to the prosecution process. Most of the respondents reported that road collision investigation practices in their countries include research based studies, typically undertaken by universities or other academic or technical research institutions, and these tend to operate in a similar way to the Road Accident In-Depth Studies (RAIDS) here in the UK and the National Automotive Sampling System–Crashworthiness Data System (NASS-CDS) in the USA. However, there are bodies that carry out some of the functions of independent investigation branches, both with multi-modal transport responsibilities and for road transport alone.

It is also clear that the organisations with responsibilities for carrying out collision investigations over more than one transport mode tend to focus on particular themes or types of road traffic collision, such as those involving public service vehicles, large goods vehicles or autonomous vehicles, etc.

On the basis of their experience, knowledge of the existing UK road traffic collision field and the initial responses received from the contacted international organisations, those countries and organisations that appeared to offer the greatest learning opportunities and potential 'best fit' models for UK application, were then chosen by the advisory panel as warranting particular attention as case studies. As noted previously, a total of ten countries and organisations were identified as case studies, comprising:

- The Netherlands OVV
- Sweden SHK
- Finland SIAF / OTI
- Norway SHK
- Denmark HVU
- France BEA-TT
- USA NTSB
- USA NHTSA
- USA CHP
- Australia

These ten case studies and the broad criteria for their selection are discussed in Section 5 of this report. As well as the individual case studies, the project team also identified additional learning opportunities from other international organisations, which are also discussed in Section 5.

4. Case studies of organisations with relevance to RCIP



Of the responses received, the examples that follow were felt to be worthy of development into more detailed case studies. These were selected by reference to the following questions:

- Does this organisation have ways of working which have the potential to bridge the perceived gaps in the UK arrangements for the investigation of collisions, with a view to learning wider lessons?
- Do the history or practices of this organisation exhibit significant points of interest in informing discussions regarding the way ahead in the UK?

In each case, it was felt that one or both of these criteria were satisfied, whether the points of interest were positive (the UK may wish to consider the adoption of similar practices) or negative (the UK may wish to avoid certain practices, or learn lessons from the development of the bodies in question). Each case study has bullet points noting key matters of interest. In all cases, where budget figures are available, the equivalent approximate amounts in Pounds Sterling are given, based on the HMRC currency conversion tables for July 2020.

4.1 The Netherlands

4.1.1 The Dutch Safety Board (Onderzoeksraad voor Veiligheid – OVV)

https://www.onderzoeksraad.nl/

The Dutch Safety Board is an independent administrative body which operates independently of the Dutch government and other parties. Its stated purpose is to learn from incidents and to make recommendations in order to improve safety. Its investigations do not address issues of blame or liability.

Funded through the Ministry of Justice and Security, the Dutch Safety Board operates with an annual budget of approximately 13.4 million EUR (£12 million). However, published reports indicate that they can experience issues with budgetary shortfalls. For example, an application for an additional 0.81 million EUR (£0.72 million) was made in 2019 (OVV, 2019).

The Board is autonomous in deciding which incidents and subjects it will investigate, and focuses primarily on cases where citizens depend on other parties to guarantee their safety, such as the government, businesses or institutions. Its investigations are not only intended to ascertain direct causes, but also to consider structural safety failings and administrative processes that have an impact on safety. In addition to specific incidents, the board's investigations include broader safety issues and hazards that have arisen incrementally over time.

Employing approximately 70 people under the direction of the Secretary Director, the Dutch Safety Board is authorised to conduct investigations in multiple domains. In addition to incidents in the aviation, railway, chemical and petrochemical industries, the board investigates incidents in the construction and health-care sectors, as well as military incidents. The Dutch Safety Board can also undertake investigations relating to Dutch parties involved in incidents abroad that have consequences extending to the Netherlands. In certain situations (various types of aviation, shipping, industrial and rail incidents), the board is under an obligation to carry out an investigation. At an international level, the Dutch Safety Board plays a role in carrying out safety investigations under international treaties and European legislation. Where necessary, the Board works in conjunction with foreign investigative bodies.

To maximise the safety gains achieved, the board has wide-ranging legal powers to conduct investigations. For example, investigators have powers to enter buildings to collect information, inspect business records and documents and seize equipment to conduct additional technical investigations.

The 2005 Dutch Safety Board Act governs both the investigation of accidents and the structure of the board. It also describes how the board must handle material collected as part of its investigations. Under Dutch law, everyone is obliged to provide all cooperation necessary to investigators in the execution of their duties, within the timeframe determined by them for the reasonable performance of their duties, and must cooperate in interviews.

When the investigators work abroad, they do so based on the arrangements within treaties and European directives, or pursuant to the laws and regulations of the country in question. Although the board is fully independent in its governance and operations, it co-ordinates its investigations with other investigative bodies. Co-ordination protocols have been developed to ensure that these parallel investigations run smoothly. The protocol between the Dutch Safety Board and the Dutch Public Prosecution Service (OM), for example, is publicly available (OVV, 2005).

Their website indicates that transparency is important to the board, and this includes its choices regarding whether to conduct an investigation, the scope of investigations and their methodologies, as well as the way in which its judgments and findings are formed.

Some investigations require investigators to undertake an exploratory investigation at the 'live' incident scene, particularly those that relate to major incidents. This would typically involve an examination of the scene, data collection, interviews with witnesses and–if safe and feasible to do so–a preliminary technical investigation. The Board uses these initial findings to determine the necessity, or otherwise, of opening a full investigation.

Investigation reports are prepared as drafts and these are issued to the various parties involved to allow for the identification of any factual inaccuracies and/or points requiring clarification. At this stage of the investigation, parties have a legal obligation to maintain confidentiality. All feedback is then considered and reviewed before the investigation report is finalised. Feedback that is not incorporated within the main body of the final report is still included in the report's review table, along with an explanatory note.

Whilst the safety board is responsible for independently deciding the publication date for the finalised reports, it aims to publish reports within a year.

Key Points:

- Focusses on cases where citizens depend on other parties to guarantee their safety, such as the government, businesses or institutions.
- Has powers to seize evidence and oblige witnesses to answer questions.

4.2 Sweden

4.2.1 Swedish Accident Investigation Authority (Statens haverikommission – SHK)

https://www.havkom.se

The Swedish Accident Investigation Authority (SHK) is a government agency tasked with investigating incidents in order to improve safety.

Although it is administered as part of the Ministry of Justice, SHK operates independently and does not consider issues of blame or liability. However, it is recognised that SHK reports and conclusions may subsequently be used in court for both criminal and civil liability purposes.

The stated task of SHK is to investigate, from a safety point of view, all types of serious civil or military accidents and incidents, whether they occur on land, at sea or in the air, and the scope of investigations include aviation, shipping, rail transport, road traffic, mining, fires, hazardous emissions, nuclear and medical technology operations.

The conditions governing when SHK undertake investigations are regulated by different statutes and vary from one investigation area to another. In some cases, an investigation is mandatory. However, in other cases, an individual assessment takes place. Typically, investigations focus on major incidents. For instance, SHK investigations would normally be expected to include incidents that result in several fatalities and/or a large number of serious injuries or extensive damage to property or the environment.

The three stated principal objectives of SHK incident investigations are to identify:

- What happened?
- What caused it to happen?
- What can be done to prevent a similar event from happening in the future, or to reduce its consequences if it does?

In cases where the incident has led to a response from rescue services, the investigation will also provide a basis for an assessment of that response and for identifying any improvements in the emergency response.

SHK has approximately 30 full time staff, 60% of whom are technical investigators. None of these staff are fully allocated to road traffic incidents. However, one investigator has a background in road collision investigation and external specialists are brought in when required from various organisations, such as academic and other research institutions, as well as private sector consultants and manufacturers, etc.

Overall, the annual SHK budget expenditure for all transport modes, which includes aviation, rail, marine, military, road and other accidents, is approximately 47 million SEK (around £4 million), with approximately 5-10% of this being allocated to external costs. Since SHK rely more heavily on external assistance when dealing with road traffic incidents, the external costs can be higher than when investigating other transport modes. An example was stated of between 500,000 and 1 million SEK (around £42,000-£85,000) for the external costs for investigating a large road traffic collision. However, this road investigation would be carried out to a level of detail comparable to international standards of investigating major accidents within the domains of aviation, rail and marine, and SHK only investigates major road traffic incidents with (near) catastrophic consequences, which statistically happen only once every three years.

The investigations carried out by SHK typically involve attendance at incident scenes as well as later detailed examinations of vehicles and other evidence. Desk-top studies are involved, but only as one element of an overall investigation.

The investigations are undertaken independently of other agencies, such as the police. However, there is always co-ordination and dialogue to ensure that the separate investigations do not impede or interfere with each other. In addition to SHK having powers to seize evidence themselves, they also have powers to request and consider all documents and evidence that the police have gathered.

SHK can break restrictions of confidentiality in other agencies evidence gathering, which means that they can request all the documents that the police have gathered, but not necessarily vice versa. Different laws apply regulating the confidentiality of SHK's gathered material in different areas–in aviation and marine investigations for example, their material is highly confidential, but in road investigations test protocols, documentation, technical reports etc. do not have a strong level of confidentiality. Interview tapes are considered working materials and are therefore not made publicly available. SHK also have powers to compel witness testimony, although it has not yet been necessary to use these powers. For all their investigations, SHK encourage openness and co-operation, and forcing an individual to testify would go against this ethos. In Sweden, there is no 'right to remain silent' (although this is somewhat simplified), but equally, there is in general no law compelling individuals to be truthful.

In situations requiring destructive testing, SHK would typically take the lead and perform the necessary tests, but in instances when the police act as the lead agency, SHK observe the testing and request the results from them.

SHK investigations to date have resulted in changes to legislation, government policy and industry standards. For example, over the last 20 years or so, SHK have been highly influential in the area of seat belt use in coaches. SHK recommendations have led to regulations requiring coaches to be equipped with seat belts and the occupants being required to use them. From a regulatory perspective, SHK have also been influential in the clarification of the responsibilities of parents, guides, drivers and other adults who supervise the use of seat belts by children (under the age of 15) in coaches.

Another outcome that has been influenced by the SHK investigatory process is the development of standards and procedures for rescue services. As a result of a specific SHK investigation that took place in the early 2000's, heavy vehicle rescue operations have been greatly improved and, nowadays, rescue services are generally much better equipped and trained in this regard.

However, it is not within SHK's mandate to track the outcomes of their investigations over time and it is therefore difficult to identify all of the subsequent improvements and risk reductions that have occurred as a result of SHK investigations.

The regulations governing SHK's operations are publicly available (SHK, various).

Key Points:

- Does not consider blame/liability, although reports can be used in court.
- Utilises external specialist technical experts to supplement limited in house capacity in the road domain.
- Has non-reciprocal powers to see police evidence, as well as powers to seize evidence and compel witnesses.
- Has led to legislative change.

4.3 Finland

4.3.1 The Safety Investigation Authority of Finland (Onnettomuustutkintakeskus–SIAF)

https://www.sia.fi/

The Safety Investigation Authority of Finland (SIAF) is the national accident investigation authority responsible for investigating major incidents, as well as all aviation, maritime, and rail collisions and incidents. SIAF is headquartered in Helsinki and funded through, and located within, the Ministry of Justice.

SIAF comprises five investigation branches: aviation, maritime, rail, 'other incidents', and exceptional events, each of which is managed and run by a chief investigator. The 'other incidents' branch investigates serious accidents that either pose a risk to life or cause significant economic or environmental harm, and this can include major road traffic collisions. SIAF have a staff of 16, of whom 60% are technical investigators, and a further 30% of hours are worked by 100 external specialists called in to work on specific investigations. These external specialists are regarded by SIAF as the most important resource they have.

SIAF cooperate with the police to the extent that the Safety Investigation Authority regards such cooperation as being appropriate (e.g. data gathering at the site i.e. photos, contact information of the persons/organisations involved, securing the site, alcohol/drug tests) and obtain copies of the police interviews as well as conducting their own. However, police reports and SIAF reports are always completely separate. SIAF always investigate the emergency response to the incident as part of their investigation and so will interview and obtain documents from other authorities.

SIAF are confident that their investigations have resulted in changes to government policy, changes to industry standards and changes to Finnish law. Within SIAF's overall annual budget of around £2 million, although there is no specific budget for investigating road collisions, it is estimated by SIAF that expenditure in this area of work is around 70,000 EUR (£63,000), amounting to one road collision investigation per year on average.

Key Points:

- Multidisciplinary teams.
- Legal rights to seize evidence, and compel witness statements.
- Power to obtain healthcare data.
- Investigation cannot be used in civil or criminal cases.

4.3.2 Finnish Crash Data Institute (Onnettomuustietoinstituutti-OTI)

https://oti.fi/

Road traffic collision investigation in Finland also falls within the remit of the Finnish Crash Data Institute (OTI), which operates as an independent unit within the Finnish Motor Insurers' Centre.

OTI receives comprehensive road traffic collision statistics from insurance companies. It is also responsible for co-ordinating independent investigations of fatal road collisions and administers the data collected from them. This latter role can require relatively close liaison between OTI and SIAF regarding the in-depth investigation and analysis of the more major or significant road traffic collisions. A legislative framework is in place to govern the coordination of investigations between these organisations. Additionally, OTI publishes several investigations and research reports every year, along with annual national road accident statistics. Under Finnish law, relatively extensive rights have been established to allow for the collection of collision data for traffic safety purposes. These legislative powers were established in 2001 and revised in 2016. However, the law limits the use of this information to traffic safety purposes only, and this is seen as a significant advantage in maintaining independence of investigation and the organisation.

Data and reports produced by OTI are used to improve traffic safety at both legislative and practical levels and are helpful in keeping relevant organisations and authorities responsible for road traffic safety up to date with current developments. In addition, various government ministries have representatives on OTI advisory groups and utilise the data and reports when considering the introduction of new laws and regulations, and/or when evaluating their potential effects. The amount and quality of the statistical data relating to road traffic collisions held by OTI are claimed to be unique by international standards. The data is made available free of charge for the purposes of scientific and statistical research, both in Finland and abroad. They typically deal with 100-150 information requests per year, including from media, researchers and academics.

OTI operates through multi-disciplinary investigation teams, and an individual road traffic collision investigation team will typically comprise a police officer, a vehicle specialist and a highways expert. The police officer acting on behalf of the OTI is independent from any other police team investigating potential offences committed, and will often be present at the 'live' collision scene shortly after an incident has occurred. In these situations, the OTI investigation team can co-operate with the police team investigating from a legal perspective and, for example, the physical evidence can be collected jointly. However, the subsequent investigations are undertaken independently, and OTI interviews with witnesses are carried out separately from those carried out by the police.

There are approximately 20 OTI investigation teams operating across Finland. However, the investigators are not OTI members of staff but are employed by other organisations and 'lent' to OTI, through a consensual arrangement, for the duration of the investigations they undertake. In total, there are approximately 300 collision investigators across the country whose contact details are on an OTI list and can be called upon to assist with an investigation. Most of them work within a single team but some are experts of specialist

professional areas, such as dangerous goods transportation, who are available to assist all teams. Whilst acting as members of OTI investigation teams, the investigators do not represent their employer and they have the rights and obligations of OTI members of staff.

There are eight full-time OTI members of staff, whose roles include: co-ordination of collision investigations; ensuring that the investigators are adequately trained and that methodologies and standards of investigation are upheld; maintaining an accident database and controlling the use of the data. In addition, OTI staff assist with national and local traffic safety work in several other ways, such as by disseminating information and providing expertise.

The annual budget covering OTI and road traffic collision investigation activity is approximately 2 million EUR (approximately £1.8 million). However, the funding is not fixed and OTI applies annually for funding from the Finnish Transportation and Communication agency.

Key Points:

- Multidisciplinary teams.
- Research based.
- Legal rights to collect data for safety purposes.
- Public/Private partnership structure.

4.4 Norway

4.4.1 The Norwegian Safety Investigation Authority (Statens havarikommisjon – SHK)

https://havarikommisjonen.no/

The Norwegian State Accident Investigation Board (SHK) is a permanent independent investigative commission for transport accidents. Starting with aviation in 1989, the board has since expanded to include rail, road traffic and shipping.

The purpose of the SHK's investigations is to investigate conditions that are believed to be important for the prevention of transport accidents and, importantly, SHK does not take a position on criminal guilt and civil responsibility.

The SHK itself determines the extent of the investigations to be carried out, including the expected safety value of the investigation in relation to the necessary resources.

The SHK typically investigates the most serious traffic accidents and is governed by a legislative framework and regulations. The investigations include attendance at 'live' collision scenes and detailed examinations of evidence as well as desk studies.

There are approximately 50 full time SHK staff, approximately 90% of whom are investigators and nine of these are responsible for dealing with road traffic collision investigations. External assistance can also be called upon when required and it is not unusual for the investigations to include the involvement of other government inspectorates, such as those responsible for work, the environment, vehicles and highway authorities, as well as other specialists.

The overall SHK annual budget covering all transport modes is approximately 7.5 million EUR (\pounds 6.7 million), of which approximately 0.8–0.9 million EUR (approximately \pounds 0.7– \pounds 0.8 million) relates to road traffic collision investigations (the latter figure comprising the 'best estimate' of the head of department).

The SHK has legal powers to assist its investigations, including the power to seize physical evidence (vehicles, infrastructure, documents etc) and the power to interview witnesses, who are legally obliged to answer their questions (i.e. citizens do not have a 'right to silence' under such circumstances).

In contrast to the situation in some other countries, such as Sweden, SHK findings and reports etc cannot be used as evidence in either criminal or civil legal proceedings. This is considered by SHK as an advantage when seeking information from witnesses and organisations that otherwise might be less co-operative.

Since its establishment in 2005, the road traffic collision department of SHK has issued approximately 70 reports and has made approximately 185 recommendations, many of which have led to changes and an increased focus on safety. Nearly all of those recommendations were on an organisational or legislative level.

The regulations governing SHK's operations are publicly available (Norwegian Government, 1965 as amended).

Key Points:

- Has powers to seize evidence.
- Has powers to compel witnesses to answer questions.
- Reports cannot be used in legal proceedings.
- Has led to legislative change.

4.5 Denmark

4.5.1 Danish Road Traffic Accident Investigation Board (Havarikommissionen for vejtrafikulykker–HVU)

http://www.hvu.dk

The objective of the Danish Road Traffic Accident Investigation Board (HVU) is to compile knowledge of road traffic accidents and apply this for the benefit of improved road safety. The investigations are independent from the investigations of the police and other enforcement agencies to ensure complete independence from any issues relating to criminal or civil liability.

The HVU comprises of an interdisciplinary group engaged in in-depth analyses of frequent and serious road traffic incidents, undertaking in-depth investigations of individual collisions. HVU investigations involve analyses based on the available material from the police, vehicle inspectors, highway authorities, hospitals/emergency rooms and the Department of Forensic Medicine. HVU also supplement such material through their own investigations of the evidence, including the vehicles involved and the collision scene, obtaining medical records for casualties, interviews with the involved parties, witnesses, as well as the emergency services that attended the collision scene.

HVU investigations are typically thematic and the methods are usually qualitative and focus on the interaction between road users, the road environment and the vehicles before, during and after the collision.

In deciding the themes to be pursued through investigations, the following criteria are utilised:

- development of accident statistics requires further data and analysis.
- knowledge of the particular issue is limited.
- other research already in progress needs further investigation.
- types of collisions receive special awareness in the public arena.
- the Minister for Transport requests HVU to analyse a problem.

When commencing an investigation of a new theme, HVU enters into an agreement with the relevant police districts for assistance with the investigation whereby the HVU will be informed by the police when a collision within the theme occurs. The police will undertake an investigation, equal to the investigation normally performed for fatal accidents, as well as carrying out vehicle examinations which is then supplemented by HVU's own investigation. The police assist this process by securing the material evidence, including vehicles.

As soon as possible after the collision, HVU's psychologist contacts the witnesses to arrange interviews, with participation being on a voluntary basis. Within a few days of the collision occurring, HVU will inspect the collision site and conduct their own vehicle examination. Site inspections are undertaken by HVU's inspection group, comprising a highway engineer, a police officer and a vehicle examiner, and vehicle inspections are conducted by a police officer and a specialist vehicle examiner. In addition, HVU gathers information from a range of authorities that can include highway authorities, vehicle manufacturers, as well as the vehicle and driver licensing authorities. HVU's medical specialists also gather further information from hospitals on the injuries of those involved and the treatment they received. All data and other evidence is then analysed and a detailed collision report produced, discussing the circumstances and causal factors, etc. Collision reports are confidential and are only available for internal HVU use.

Once sufficient individual collision reports have been prepared, these are analysed and a final thematic report is produced, which typically includes:

- a review of each collision's casual and contributory factors.
- a description of issues that are consistent across the collisions.
- HVU's recommendations for initiatives for the prevention of this type of accident.
 HVU's general recommendations for crash prevention are based on an analysis of the measures which, according to the analysis, could have prevented or limited the individual collisions.

All data used in the thematic report has been anonymised, and the report is HVU's interpretation of the results within the specific theme.

HVU have a staff of 13-14 people involved in collision investigation, approximately half of whom are full-time. Most of these staff are investigators with technical expertise, and external specialist resources can also be called upon where necessary. The overall annual HVU budget is approximately 4.3 million DKK (around £0.5 million) plus a certain number of 'in-kind' contributions.

The HVU has legal powers to assist in its investigations, including the power to seize physical evidence (vehicles, infrastructure, documents, etc). However, they do not have the power to force witnesses to provide testimony. As in Norway, the Danish HVU findings and reports cannot be used as evidence in criminal or civil legal proceedings.

The head of the HVU responded to the authors of this report that they are confident that their investigations have assisted in improving policies, standards and legislation, as well as improving road safety.

Key Points:

- Not multi-modal.
- Conducts thematic investigations based on its own in-depth investigations of individual accidents.
- Utilises police resources to upgrade level of investigation on cases of interest.
- Has in house medical specialists.
- Has powers to seize evidence but not to compel witness testimony.
- Reports cannot be used in legal proceedings.

4.6 France

4.6.1 The French Land Transport Accident Investigation Bureau (Bureau d'Enquêtes sur les Accidents de Transport Terrestre BEA-TT)

http://www.bea-tt.developpement-durable.gouv.fr/

The French Land Transport Accident Investigation Bureau (BEA-TT) was formed in 2004 and investigates accidents involving all forms of land transport, including railways, urban guided transportation systems (metros, trams), cable-hauled transport systems (including ski-lifts), road transport (heavy goods vehicles, and public transport by coach and bus), as well as canals and other navigable inland waterways.

A technical investigatory body for the aeronautics sector in France was created as early as 1946 and, in 1997, this was expanded to include the maritime sector. Prior to an incident involving a severe fire in the Mont Blanc road tunnel in 1999, which killed 39 people, no equivalent structure had been set up for land transport. This incident caused the Minister of Transport to set up an *ad hoc* investigatory commission supported by the Civil Engineering General Council (Conseil Général des Ponts et Chaussées–CGPC). However, the CGPC experienced considerable difficulties and, in the light of their experience, it became apparent that a legal status was required for such technical investigations, in order to guarantee to all investigators access to sites, materials and other evidence.

In 2002 an act was passed which has provided the legal basis for all subsequent technical investigations of major incidents. It provides for such investigations to be carried out by permanent specialised bodies and for these bodies to have the right of access to all elements useful to an investigation, including those covered by non-disclosure of pre-trial information, and medical or professional confidentiality.

In the event of major incidents, a two-fold investigative approach is adopted: a judiciary inquiry to identify liabilities (and if necessary, to determine compensation for the victims) and a technical investigation to prevent similar occurrences. The technical investigation is, by necessity, separate from the legal investigation, as its objectives and constraints are different.

The timeframe for the completion of technical investigations is much shorter and the approach taken is that information collected must be made public to justify all recommendations made. As there is a need to preserve evidence, including witness recollection of facts, and to focus on lessons drawn from such situations, these investigations are undertaken by a permanent bureau of independent specialist investigators. The decision to open technical investigations is made by the Director of the BEA-TT. In the rail sector, investigations into the serious accidents designated by the European Rail Safety Directive 2004/49 are mandatory. In other rail-related cases, the Director of the BEA-TT decides on the appropriateness of the investigation. For non-rail modes of land transport, the decision of the Director of the BEA-TT is taken at the request, or with the agreement, of the French Minister of Transport. All safety recommendations made are sent to relevant recipients, which in turn inform the BEA-TT of the resulting actions that they intend to take. Whilst the BEA-TT make its recommendations and the recipients' responses public, it is not responsible for monitoring or inspecting their implementation.

As of 1 January 2019, BEA-TT had an authorised permanent staff of 14 officers, comprising two executives, nine permanent investigators and three administrative officers. A doctor from the General Inspectorate of Labour is also attached to the bureau to assist with the investigation of medical aspects, and other specialist external resources are available when required. An investigation may be conducted by investigators from BEA-TT's own staff and by temporary investigators, who are commissioned for the needs of an investigation by the Director of the BEA-TT and enjoy the legal status and powers of technical investigators. The temporary investigators may be active or retired employees of a transport company, infrastructure managing organisation, or civil service body with regulatory responsibilities, or may be technical specialists required to investigate particular issues. Furthermore, the BEA-TT can call on all relevant state services in its field, which notably involves monitoring and the reporting of incidents. In practical terms, permanent investigators typically organise the investigators and any external experts selected to provide the range of skills and abilities deemed necessary for each investigation.

In 2018, more than 2,800 incidents were brought to the attention of BEA-TT. The initial information gathered about these events led to more in-depth investigations of nearly 500 of them and these in turn resulted in opening 11 full BEA-TT investigations. Of these, two were in the road sector; five were in the rail sector (three of which were on level crossings); two related to urban guided transport; one was ski lift related; and one was marine.

The 2018 budget allocation for operations and studies amounted to 50 million EUR (£44.75 million).

Key Points:

- Established to overcome the issue of *ad hoc* commissions without sufficient powers to access evidence.
- Has legal powers to access any items of interest, regardless of confidentiality or legal privilege.
- Utilises a network of temporary investigators who have the same legal powers as the staff investigators.

4.7 USA

4.7.1 National Transportation Safety Board (NTSB)

https://www.ntsb.gov/

The National Transportation Safety Board (NTSB) is an independent federal agency dedicated to promoting aviation, railroad, highway, marine and pipeline safety. Established in 1967 as a branch of the Department of Transportation (DoT) and headquartered in Washington, DC. The agency was restructured and acquired the status of an independent agency when mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation.

The NTSB's independence was seen as a prerequisite for its functioning without any appearance of bias, and the rationale underlying the NTSB's complete independence was expressed by the US Congress in the following statement:

"Proper conduct of the responsibilities assigned to this Board requires vigorous investigation of accidents involving transportation modes regulated by other agencies of Government; demands continual review, appraisal and assessment of the operating practices and regulations of all such agencies; and calls for the making of conclusions and recommendations that may be critical of or adverse to any such agency or its approval. No Federal Agency can properly perform such functions unless it is totally separate and independent from any other department, bureau, commission, or agency of the United States." (ETSC, 2019)

The NTSB publishes accident reports, safety studies, special investigation reports, safety recommendations and statistical reviews. The NTSB is bound by its own regulations not to assign fault or blame for an accident or incident. Similar to the situations in Norway and Denmark, laws prohibit the admission or use of any part of an NTSB report in a civil action for damages arising from a matter mentioned in the report (whilst NTSB preliminary Findings of Fact are admissible in court proceedings, their final accident reports and recommendations are not).

The Office of Highway Safety (OHS) is the department within the NTSB responsible for road traffic collision investigations and their remit is to investigate significant crashes that are likely to impact the public's confidence in highway transportation safety, generate high public interest, or highlight national safety issues. Investigations cover a wide range of incident types with potential national safety significance, such as collapses of highway bridge structures, fatalities on public transportation vehicles (such as buses and vans), and collisions at highway/rail grade crossings, i.e. 'level crossings' as they are generally referred to in the UK. In addition to these more catastrophic crash events, the Office of Highway Safety also conducts studies based on emerging trends from crash investigations and other research to identify common risks or underlying causes of crashes.

The Investigations Division of the OHS comprises three investigative teams, each led by an investigator-in-charge. Each team is formed by investigators that specialise in human performance, highway factors, vehicle factors, survival factors and commercial motor carrier operations. These teams undertake in-depth investigations, including on-scene attendance and detailed examinations of physical evidence including vehicles, etc. Team members are distributed throughout the country to enhance geographic coverage and reduce response time. NTSB investigators have the power to access incident scenes and other premises, to seize evidence and to subpoen a witnesses to testify to their investigation.

The Report Development Division of the OHS is responsible for researching and developing national highway safety issues and managing the development of the final accident reports and safety recommendations. This Division is also responsible for managing Public Hearings related to ongoing accident investigations and forums designed to make the public more aware of highway safety issues. One of the key objectives of the NTSB is to issue appropriate recommendations and, since 1990, the NTSB has compiled and published an annual 'Most Wanted' List of transportation safety improvements that is aimed at increasing awareness of, and raising support for, the most critical recommendations for reducing accidents and saving lives. However, the NTSB faces several challenges in this regard, and these include:

- Developing those recommendations that can be implemented in a more impactful way.
- Limited NTSB resources create challenges to identify and encourage recipients to implement open safety recommendations.
- How to increase NTSB's presence at state legislative sessions to elevate the priority of highway safety at the state level and advance legislators' understanding of the issues.
- How to best ensure that the rulemaking process, which can take years, does not hamper the successful implementation of recommendations.

It is also recognised that, for those recommendations requiring regulatory action, the duration and complexity of the rulemaking process make it difficult for recipients to act on safety recommendations in a timely fashion. This necessitates the NTSB spending significant amounts of time monitoring the progress of each recommendation. NTSB's annual budget is 110.4 million USD (£88 million), of which 8.5 million USD (£6.8 million) is spent on investigations of road traffic collisions.

Key Points:

- Does not assign blame, reports cannot be used in civil legal proceedings.
- Has primacy of investigations unless an intentional criminal act is identified.
- Has powers to seize evidence and to compel witness testimony.
- Publishes a combination of individual case reports, thematic studies and statistical reports.
- Invests time in monitoring implementation of its recommendations.

4.7.2 National Highway Traffic Safety Administration (NHTSA)

https://www.nhtsa.gov/

The National Highway Traffic Safety Administration (NHTSA) is responsible for setting, maintaining and enforcing road vehicle performance standards at a national level, as well as facilitating the testing and deployment of advanced vehicle technologies, identifying and eliminating vehicle defects, and educating the public to help them drive, ride and walk safely. The stated mission of the NHTSA includes not only to save lives and prevent injuries, but also to reduce the economic costs associated with road collisions.

The NHTSA has approximately 625 full-time employees located across the country and currently operates with an annual budget of 914.7 million USD (around £730 million), although this includes Highway Traffic Safety Grants, awarded to states for meeting certain criteria. The amount budgeted for Vehicle Safety Programmes and Highway Safety Research and Development is 304.5 million USD (£242.5 million).

The NHTSA has two research offices, the Office of Vehicle Safety Research, and the Office of Behavioral Safety Research. The research programmes undertaken by the Office of Vehicle Safety Research are prioritized based on the potential for collision and injury reduction and is aligned with Congressional Mandates, along with the US Department of Transportation and NHTSA goals.

The Office of Behavioral Safety Research studies behaviours and attitudes in highway safety, focusing on drivers, passengers, pedestrians, and motorcyclists. These findings are used to develop and refine countermeasures to deter unsafe behaviours and promote safer alternatives.

Since 1972, the NHTSA has also operated a Special Crash Investigations (SCI) Program, which provides the agency with the flexibility to quickly acquire detailed engineering information on 'high visibility traffic crashes of special interest'.

The SCI Program collects in-depth collision data on new and rapidly changing technologies in real world crashes. NHTSA uses the data collected in this programme and others to evaluate standards and legislation, while the automotive industry and other organisations use the data to evaluate the performance of motor vehicle occupant protection systems, such as air bags.

The SCI Program provides NHTSA with the most in-depth and detailed level of crash investigation data collected by the agency. This data ranges from the basic information contained within routine police and insurance crash reports, to comprehensive data from special reports by professional collision investigation teams. Hundreds of data elements relevant to the vehicle, occupants, injury mechanisms, highway environment and safety systems are collected for each of over 100 crashes designated for study annually. These SCI cases are intended to be an anecdotal dataset useful for examining special crash circumstances or outcomes from an engineering perspective.

One of the main advantages of the SCI Program is its ability to locate unique real-world crashes anywhere in the country and perform in-depth independent investigations in a timely manner that can be used by the automotive safety community to improve the performance of its advanced safety systems. Past cases have triggered interest from individual companies, as well as the industry as a whole, to improve the safety performance of motor vehicles, notably passenger cars, light trucks, and school buses.

Collisions that are of interest to the SCI Program are identified through a network of sources, including NHTSA's Vehicle Safety Hotline, the Department of Transportation's National Response Center, NHTSA's regional offices the Office of Defects Investigation (ODI), automotive manufacturers, other government agencies, law enforcement agencies, insurance companies, vehicle owners, engineers and medical personnel.

Collision selection is based on the current and evolving needs of the agency, and the programme's flexibility allows for detailed investigations of emerging technologies, such as the performance of alternative fuelled vehicles, child restraint systems, adaptive controls, vehicle-pedestrian interactions, and other potential safety defects. In the recent past, resources have also been concentrated on collisions involving automatic restraints (air bags and safety belts) and school buses.

In addition to obtaining the preliminary information available regarding the collisions to be studied, SCI Program data collection consists of three main parts: scene inspection, vehicle inspection(s), and interview(s) with those involved in the crash. NHTSA investigators have powers to enter a wide range of premises and to seize vehicles for 72 hours, as well as to subpoena witnesses to testify to their investigation.

The scene investigation involves the collection of physical evidence from the collision site, including data such as any skid/yaw/gouge marks and other relevant data in attempt to identify matters such as the vehicle approach lines, the precise point of impact and the final rest positions of the vehicles, etc. The vehicles are then inspected, and an analysis is made of the crash dynamics, damage, occupant kinematics, and the safety systems. A complete set of images is taken of the scene and each vehicle. The data from the scene and vehicle are also augmented by interviews with witnesses and relevant official records, such as police reports, medical records, etc.

All data collected is confidential and all public SCI files are anonymised, as the research teams are only interested in information that will assist in understanding the nature and consequences of the collisions. Each investigation generates extensive information about pre-collision, collision scenario, and post-collision events of the occupants, vehicles and environmental factors that may have contributed to the event's occurrence or severity. Detailed documentation of the safety features (particularly those related to any of the Federal Motor Vehicle Safety Standards) is also provided.

The participation and co-operation of automotive manufacturers, suppliers, law enforcement agencies, hospitals, physicians, medical examiners, coroners, insurance companies, tow and salvage yard operators, and the individuals involved in crashes are considered to be essential to the success of the SCI Program.

One example of the positive impact of the SCI Program is the pivotal role of SCI investigations and recommendations in the establishment of Federal Motor Vehicle Safety Standard 208, which relates to vehicle air bags. The SCI air bag cases have been and continue to be used by the agency and the automotive safety community to better understand the real-world performance of these systems. They have also contributed to the evolution of air bag systems production. Currently, the SCI Program continues to monitor collisions involving air bags as the fleet and air bag technology evolves.

Furthermore, the SCI Program's flexibility allows for investigations of new emerging technologies related to automotive safety. These anecdotal SCI Program cases are utilised by NHTSA and the automotive safety community to understand the real-world performance of emerging systems.

Key Points:

- Remit includes the reduction of the economic costs associated with road collisions.
- Has powers to seize evidence and to compel witness testimony.
- Can issue vehicle and equipment recalls.
- Largely data driven, including police and insurance company data.
- Undertake thematic investigations.
- Close links with the automotive industry.
- Has resulted in legislative change.

4.7.3 California Highway Patrol (CHP)

https://www.chp.ca.gov/find-an-office/headquarters/assistant-commissioner-staff/collision-investigation-unit/multidisciplinary-accident-investigation-teams

The California Highway Patrol's (CHP) Multidisciplinary Accident Investigation Team (MAIT) programme was established in 1978 as a result of concerns that more intensive investigations were required to better establish subtle collision and injury causes. The primary objective of the MAIT programme is to prevent collisions of a similar nature from recurring. However, they are also required to include the support of their investigations through the criminal and civil litigation processes, including acting as expert evidence in the trial process if required.

The MAIT programme aims to conduct in-depth investigations and analyses of major traffic collisions throughout the state. As with a usual police led investigation, this includes the reconstruction of an incident and a study of the factors that may have contributed to it occurring, including environmental, human and mechanical elements associated with the three phases of a collision (pre-collision, at-collision and post-collision). However, the ultimate objective of the MAIT programme is the utilisation of these identified causation factors to prevent collisions of a similar nature from recurring.

The current MAIT Program consists of teams based in each of the eight CHP divisions to give good geographical coverage of the state. Each team consists of investigators with specialised training in traffic collision reconstruction. Currently there are around 50 full time traffic crash reconstruction specialists assigned to MAITs and approximately 40 associates. Associates are CHP officers that are traffic crash reconstruction specialists and who are assigned to local area CHP offices, primarily performing routine patrol duties. The MAITs are composed of one CHP sergeant (the team leader), two or more CHP officers, one Motor Carrier Specialist I (MCS I), and one Senior Transportation Engineer from California Department of Transportation (Caltrans).

As with police forensic collision investigators in the UK, the MAIT officers are trained in the physics of collision analysis and reconstruction, occupant kinematics, vehicle dynamics (collision damage analysis), scene photography, the use of surveying equipment, and Computer-Aided Design software. These officers also conduct detailed interviews and assist the MCS I with conducting in-depth mechanical inspections of involved vehicles. In addition to the officers assigned directly to the team, MAIT associates are used whenever possible.

A significant feature of the MAIT programme is the inclusion of highway engineers as part of the team. The Caltrans Senior Transportation Engineers have the specialised technical knowledge which allows them to conduct in-depth investigations into the environmental factors and highway conditions at the incident scene.

There are two categories of MAIT investigations, full and limited. When an incident occurs, the MAIT team leader determines the scope and direction of each investigation and coordinates team efforts. In a full investigation, the team handles all aspects of the traffic collision investigation and their report is the original report. During a limited investigation, the team handles a specific aspect of a traffic collision and their report is a supplemental to an original report. The case workload is dictated not only by the number of requests from the CHP and allied agencies, but also the complexity and level of each investigation.

Key Points:

- Integrates highways expertise into the investigation team.
- As a police team investigating for prosecution as well as for safety improvements, MAIT have powers to seize evidence and interview witnesses, but cannot compel them to answer.
- Evidence gathered is used in criminal and civil proceedings.

4.8 Australia

4.8.1 Federal and state level development

The federal level Australian Transport Safety Bureau (ATSB) and 'counterparts' at state / territory level (e.g. the Office of Transport Safety Investigations, OTSI, in the state of New South Wales) have been established to conduct no-fault investigations into transport related incidents. In simple terms, these bodies cover fatal crashes and incidents of significant public interest in the aviation, rail and marine domains. There is no routine investigation of road transport by these bodies, except in some cases where public service vehicles (e.g. bus fires) are involved.

In summary, current policy is for all fatal road crashes (or those expected to become fatal) to be investigated by the pertinent state / territory police Serious Crash Units (SCU–forensic collision reconstruction units). The ultimate focus of their investigations is to establish fault and the prospects of road-user prosecution. Therefore, the focus is on the road user and vehicle, and in the majority of instances, little or no emphasis is placed on attempting to identify any wider lessons to reduce future risk.

Whilst every effort is made by the police to cover serious injury crashes, these are more likely to be attended by Highway Patrol or General Duties officers. This is also the case with respect to minor injury and damage-only incidents and, in some states/territories, a policy has been established recently whereby crashes do not need to be notified or attended where the parties involved do not require medical treatment and the vehicles can be moved or recovered safely without police assistance.

The standard forms used by the police to record the details of road crashes they do attend does include prompts regarding the road environment. However, if this information is ultimately served in civil proceedings following an incident, the information gathered and reported can cause considerable concern to the road agency (highway authority) that may only have become aware of this information some considerable time after the collision occurred.

One key question within the proforma is: 'Is the road surface defective – yes or no'. It is often expressed by road agencies that many police officers completing these forms and answering this highly significant question lack the technical experience and expertise to assess the road environment and its infrastructure. The road agency is then sometimes in the difficult position of investigating a police finding that was made some time previously, based on the data, documentation and experience currently available.

Other than routine data transfer, there is currently no automatic line of communication or exchange of information and/or experience between the police and road agencies over investigations. However, there are emerging local examples of where experiences and technical issues are discussed.

Where fleet owners and insurers, etc., show a specific interest in a collision, third party investigators can be commissioned to conduct at-scene and/or post-collision investigations.

To be assured of obtaining pertinent information and data following collisions on their networks, both state/territory and local road agencies conduct their own site investigations (typically post event), as well as further reviews of individual incidents and wider, network level analyses. The scope and depth of these investigations and reviews varies by jurisdiction, in accordance with local levels of resourcing and experience.

The most mature protocols have been established by the state / territory road agencies. For example, Transport for New South Wales (TfNSW) through its Centre for Road Safety (CfRS) have developed a policy and protocols to investigate all fatal crashes on its state road network, resourced from and undertaken by the pertinent regional offices. Road agency investigations tend to focus on asset management issues, i.e. infrastructure provision and condition, although some consideration is inevitably given to whether the road agency has fulfilled its generic 'duty of care' and the likelihood of future litigation. Mitigation measures are considered for inclusion in location specific activities or as part of wider network level programmes. Cluster site studies can also utilise the data from incidents across a region.

In the last 12-18 months road agencies have commenced a programme of 'incident reviews', with the aim of increasing learning from collisions. Findings (including those from police investigations) are collated and analysed, and then communicated both internally and externally with a view to improvements in highway designs, standards, policies and practices.

A good example of this is again New South Wales, where TfNSW and its CfRS are undertaking 'incident reviews' of cases that are high profile; complex; have high media or community interest; exhibit unusual characteristics; or as alluded to, consider multiple incidents from across the state demonstrating a repeat causation pattern. Importantly, a 'blameless' investigative approach has been adopted, i.e. focusing on the facts, and a further principle is to be as open and transparent as possible, issuing bulletins and reports that are in the public domain. CfRS are also currently working with the Australian Road Research Board (ARRB) to find ways to enhance and extend this process, including mentoring for local road agencies, in the hope that, if it is well received, it might be possible to roll it out nationally and even potentially become a model for other modes to embrace.

Although further work and commitment are required, it is interesting that this initiative is being driven by road agencies rather than government or the automotive industry, as has been more commonly seen in other jurisdictions. It is hoped that the newly created federal Office of Road Safety (ORS) will further consider and ultimately adopt these principles and practices. This is considered both important and timely as, like many countries, Australia's target of 30% casualty reduction between 2010 and 2020 has not yet been reached, and hitting future targets of a 50% reduction by 2030 and zero fatalities and serious injuries by 2056 will be challenging (Australian Transport Council, 2011, Australian Transport and Infrastructure Council, 2018 and AAA, 2019, for example).

Currently, there is significant public and political interest in what more might be done to improve road safety, and this includes challenging and reviewing how road related incidents are currently investigated to unlock their wider learning potential. This includes learning from principles and protocols adopted in other transport modes, e.g. the rail industry, especially where officers from these modes are moving into road agencies and are starting to perceive deficiencies in approaches to safety when compared to their previous experiences. The adoption of a 'blameless' approach, which can also pick up models such as root cause analysis, are the cornerstone of advancement, and are also consistent with road agencies' preference for proactive and predictive approaches – both of which aim to mitigate risk in advance of crashes occurring. A more holistic approach is also advocated–considering the road as a system – a paradigm shift from just considering the road environment (the infrastructure provision and its condition).

Key Points:

- Expert police resources are focused on fatal incidents and learning across the system (human, vehicles and road environment) and opportunities for learning and continual improvement are being missed.
- Road Agencies (highways authorities) are taking the lead in advocating a 'blame free' investigation culture.
- Principles and methods (e.g. blameless investigations, 'Learning From Incidents' and root cause analysis) are being considered and promoted from other industries/ sectors.

4.9 Summary of Case Study Findings

Table 4.1 below summarises the main findings arising from the case studies discussed above and it also includes reference to national statistics such as annual road deaths, length of network, population etc, in accordance with the RCIP brief and to assist when comparing numbers and costs between different countries and international organisations.

Table 4.1: Summary of case study findings

ζοnntry	Nrganisation	Total Budget (GBP Equiv.)	ସେଥ) fegbuð fnsvelef (.viup∃	entred broß IsunnA	Length of road Network (000 of KM)	(snoillim) noitsluqoq	Deaths per 100,000 Population	Does not establish blame	IsboM-itluM	Multidisciplinary	Powers to seize Evidence	Powers to compel witnesses	Specific Investigations	Thematic Investigations	Uses external resources if required	Reports can be used in court
Netherlands	MO	1.0m	ı	680	139	17.1	3.86	>	>	>	>	>	>	>		×
Sweden	SHK	4.0m	I	220	215	10.1	2.18	>	>	>	>	>	>	×	>	>
Finland	SIAF	2.0m-	0.06m ^a	210	78	5.5	3.82	>	>	>	>	>	>	>	>	×
Finland	OTI	1.8m	1.80m	210	78	5.5	3.82	>	×	>	×	×	>	>	>	×
Norway	SHK	6.7m	0.80m	110	95	5.4	2.04	>	>	>	>	>	>	>	>	×
Denmark	AIB	0.5m	0.50m	200	06	5.8	3.45	>	×	>	>	×	×	>	>	×
France	BEA-TT	44.75m	0.05m ^a -	3,240	1,103	65.3	4.96	>	>	>	>	>	>	×	>	I
USA	NTSB	88.0m	6.80m	36,120	6,697	331.0	10.91	>	>	>	>	>	>	>	>	d × ×
USA	NHTSA	730.0m	242.00m	36,120	6,697	331.0	10.91	>	×	>	>	>	>	>	>	d ×
USA	CHP	1	I	3,540°	315°	39.8°	8.89°	×	×	>	>	×	>	×	×	>
Australia	None yet established	1	I	1,200	878	25.5	4.71	I				1			1	I
Source: Ouestionnaire retu	SU											-			-	

Notes: (a) Published material and personal correspondence (b) Some reports can be used in some courts, others cannot; (c) State rather than national data; Source.

5. Additional Learning



In addition to those countries and organisations identified above as having significant enough learning opportunities for the UK setting to warrant being used as case studies, a number of other countries' organisations were identified as warranting discussion in a more limited way. These additional learning opportunities incorporate elements or practices that may be of interest to the RCIP and future potential UK developments.

5.1 Germany

5.1.1 German In-depth Accident Study (GIDAS)

https://www.gidas.org/

The Federal Highway Research Institute (BASt) and the German Association for Research in Automobile Technology (FAT) operate a co-operative German In-Depth Accident Study (GIDAS).

This collaboration between public and private sector organisations is a noteworthy aspect of GIDAS, and it is significant that the steering group comprises representatives from the federal highway research institute, university based research institutes and a working group from FAT represented by companies such Audi AG, BMW AG, Continental AG, Mercedes Benz AG and Robert Bosch GmbH. The GIDAS project started in Hannover and Dresden in 1999 as a result of the growing need for in-depth accident data. The goal was to establish collision data collection programmes in those cities that encompass all traffic situations and road types, with a view to ensuring the data was applicable to, and representative of, the country as a whole. As a result of its longstanding history, the GIDAS collision database is now relatively extensive and it is stated that analyses allow the Federal Highways Research Institute, as well as the automotive industry (through FAT), to evaluate their systems, optimise them and/or to develop new ones.

GIDAS investigations comprise detailed in-depth analyses of individual collisions that consider up to around 3,600 parameters relating to the highway environment, the vehicle(s) and the involved road users. Investigated cases are selected from the personal injury accident database held by the police and some of the investigations include the collisions being fully reconstructed and simulated using specialist computer software. When appropriate, the investigation team can include medical professionals, and can include a psychological interview to ascertain further information regarding the potential human factors aspects involved in causation. These interviews have been found to assist in the identification of situations where a road user has failed to accurately identify aspects of the highway environment or failed to properly interact with automotive systems. With the agreement of the participants, GIDAS investigations can include consideration of possible long-term consequences of the collision, as well as hospital procedures, which can inform potential improvements for hospitals and paramedics.

5.2 Malaysia and South East Asia

5.2.1 ASEAN Road Safety Centre

http://miros.gov.my/

In 2014, the transport ministers of the Association of South East Asian Nations (ASEAN) appointed the Malaysian Institute of Road Safety Research (MIROS) as the ASEAN Road Safety Centre, which aims to promote and provide knowledge on road safety issues among the ASEAN Member States.

Principally engaged in research, MIROS collaborates closely with local and international government agencies and private bodies to further the cause of road safety, serving as a one-stop centre for the generation and dissemination of road safety information and data. The scope of information dealt with by the centre is relatively wide and encompasses road traffic laws and regulations, data management, standards development, as well as road safety awareness and education. It is stated that the findings derived from research and evidence-based intervention programmes provide the basis for the formulation of new strategies, legislation, policies, and enforcement measures, governing road safety at the national and ASEAN level.

One especially noteworthy matter is that MIROS are tasked with investigating road traffic collisions that have particular national or ASEAN significance, involving large scale public interest and/or mass casualties. To date, MIROS has investigated over 1000 cases, the findings of which provide evidence-based data that has helped the government develop and implement new intervention, policy and law to increase road safety. One example of this is the rear seatbelt law, which was introduced in 2009. Other areas where notable crash investigation findings have been translated into policy and legislation include road safety barriers, driver fatigue, driving under the influence of alcohol and bus roadworthiness. Additionally, crash investigation provides continuous real-world evidence of the effectiveness of the United Nations Economic Commission for Europe (UNECE) regulations that are being adopted by Malaysian government, such as UNECE Regulation R66, uniform technical prescriptions concerning the approval of large passenger vehicles with regard to the strength of their superstructure. However, despite many successful countermeasures resulting from crash investigation, it is reported that a lack of enforcement action on the part of the relevant authorities has resulted in a poor level of response to those recommendations (MIROS, 2017). Furthermore, implementation of the recommendations has not been formally monitored or assessed. Therefore, it is feared that although safety related issues have been identified and reported, the risks arising from these issues still exist.

To address this situation, the Independent Advisory Panel to The Minister of Transport Malaysia put forward a recommendation to establish a National Transportation Safety Board (NTSB) that serves as an independent body to conduct high profile investigation and analysis of road, rail, aviation and maritime crashes. At the same time, MIROS has also strengthened its standard crash operation procedure to include a systematic and structured monitoring mechanism for the MIROS recommendations from national inquiry cases. As a result, all national inquiry cases investigated by MIROS have gone through a monitoring process to ensure the proposed recommendations are effectively implemented by the relevant party since January 2019. Despite these recent developments, MIROS are concerned that without the power to issue binding recommendations, responses may not take place in a timely manner.

MIROS conducts research projects to cater for road safety issues in Malaysia and, in order to recommend high impact interventions towards road safety, MIROS also conducts in-field operations and they regard real-world in-depth crash investigation as a core activity of the organisation.

MIROS' crash investigation work covers all types of road traffic collisions in Malaysia including Sabah and Sarawak. Crash investigations are conducted by a team of eight core members, five associate members and several supporting members. The current strength of the team enables them to cover three cases at a time. A team of two or three crash analysts is dispatched to a crash site to collect physical data and evidence such as crash configuration data, crash vehicles, the environment, the road profile, and injury details with the help of Traffic Investigation Officer (IO) of the Royal Malaysian Police (RMP). The team then use the data and evidence to reconstruct the accident and suggests recommendations for improvements. From January 2011 to December 2013, MIROS had analysed 167 road traffic collisions.

However, MIROS' crash investigation team only attends cases that meet specific requirements. The team only attends to:

- Crashes that involve any vehicles with three fatalities or above.
- Crashes that involve commercial vehicles with one fatality or above.
- Crashes with many fatalities, and trigger the ministry's inquiry and national interest.
- Crashes or cases related to the current or future research by MIROS.
- Cases of special requests from other government and external agencies.

Findings from MIROS' crash investigations not only highlight potential future research, but are also used as indicators for high impact interventions and baselines for new national policies towards road safety.

In MIROS, the Crash Reconstruction Unit (CRU) maintains a comprehensive, in-depth crash database and, apart from investigative work, CRU conduct training and regularly provide workshops to public and professionals on various topics related to crash investigation and reconstruction. As well as collision reconstruction expertise, the team also undertake other technical investigations, such as forensic materials analyses carried out within their specialist laboratory. To date, CRU has investigated over 1000 high profile crashes all over Malaysia and has trained multiple government agencies from other countries such as Brunei, Tanzania and India.

5.3 New Zealand

5.3.1 National Road Policing Manager

https://www.police.govt.nz/about-us/structure/teams-units/road-policing

The New Zealand Police National Road Policing Manager's remit includes the investigation of road traffic collisions. Standardised forms are completed by police officers in respect of personal injury collisions that allow later statistical analysis. In addition, the most serious collisions are subject to in-depth investigation and analysis by specialist police forensic collision investigation officers that operate on a regional basis and in a similar manner to the equivalent units in the UK.

Perhaps the most interesting feature of the overall system for dealing with road traffic collisions in New Zealand is that compensation for injuries is paid from the national Accident Compensation Corporation (ACC) scheme (https://www.acc.co.nz/). This negates the need for civil litigation in respect of road traffic collisions and assists in maintaining an overall 'no blame' culture in this respect.

5.4 India

5.4.1 Road Accident Sampling System - India (RASSI)

http://www.rassi.org.in/

India has no national road collision investigation function and policing practices vary from state to state. However, since 2011 the Road Accident Sampling System-India (RASSI) programme has been in effect providing an in-depth collision database with data collected at collision sites by crash investigation researchers. The programme currently operates from five centres across the country, providing both a geographical spread and covering a range of different road and traffic types, from urban to expressway.

RASSI is run by a road safety research company, JP Research India, and the on-site crash investigation and in-depth crash data collection activities are conducted under a public/private partnership model funded by a consortium of automotive manufacturers and suppliers.

Government agencies do not assist with funding but co-operate with the programme, as well as providing notifications of collisions that have occurred. In return for this cooperation, including allowing the programme's investigators collision scene access, as well as permission to examine vehicles and access to injury reports etc, RASSI supplies the authorities with monthly, quarterly and annual progress and status reports. These include statistical analysis, as well as individual collision reports, identifying contributing factors (human, vehicle and infrastructure), as well as any injuries sustained by those involved. The reports also include suggestions regarding potential risk reduction measures in terms of preventing future incidents of the same type and/or reducing outcome severities.

The private sector consortium members funding the programme receive technical data from the investigations, which they can then feedback into their in-house safety research and development programs.

5.5 Canada

Canadian police forces are responsible for dealing with and investigating all road traffic collisions on a local jurisdiction basis. Each province or territory (10 provinces and 3 territories) set their own reporting/investigation legislation. In addition, there are two federal agencies that are beneficial in providing staff resources in specific circumstances.

5.5.1 Transportation Safety Board (TSB)

https://www.tsb.gc.ca/

The first federal agency is the Transportation Safety Board (TSB). TSB's mandate includes air, marine, rail and pipeline incidents. Road traffic collisions are not included within its scope. However, TSB does have the staffing levels required to investigate large scale road traffic collisions and does investigate incidents involving the road/rail interface. When doing so, the TSB can make recommendations in relation to road vehicles as well as rail. For example,

previous recommendations have included the use of in-vehicle video displays, crash data recorders for road vehicles and the crashworthiness of commercial passenger buses.

5.5.2 Transport Canada

https://www.tc.gc.ca/en/transport-canada.html

The second federal agency, Transport Canada is responsible for establishing and maintaining federal motor carrier standards and regulations, and investigates potential safety equipment issues when notified by the local police or private consulting companies that have reported potential issues. Transport Canada is often seen as being analogous to the National Highway Traffic Safety Administration (NHTSA) in the USA (discussed as a case study earlier in section 4 of this report). However, Transport Canada does not have the same level of authority or investigatory powers as the NHTSA. Additionally, Transport Canada does not have the internal capacity to manage large-scale crash investigations, with only 4 in-house investigators.

Transport Canada's Road Safety Directorate have been carrying out their road safety oversight mandate since 1970 by funding a national network of university and private consultant based collision and defect investigation teams. Located in major regional centres, the geographically dispersed teams provide a mechanism for Transport Canada to monitor vehicle safety issues across the country.

This system of university and private consultancy based investigation teams initially began as a mechanism to allow the more detailed examination of passenger car collisions. Transport Canada later expanded the team mandate to address safety related concerns for other vehicle types. In more recent years, the focus of the Transport Canada collision investigation program has been the Directed Studies Initiative, which concentrates on examining specific aspects that are of interest to the directorate. These aspects may relate to vehicle type, vehicular features or systems, collision configuration, occupant age, etc. Directed Studies to date have included collisions involving airbags, moderately severe side impacts, light trucks and vans and heavy trucks. Part of the Directed Studies programme requires the teams to conduct Special Investigations that typically comprise collisions resulting in a particularly large number of casualties, that are of an unusual nature, or are of other special interest to the directorate. To date, Special Investigations have included collisions involving school buses, child restraint systems and propane fuelled vehicles.

The investigations undertaken by Transport Canada are in-depth and sometimes involve being called by the police to attend 'live collision scenes'. These investigations typically include assessing the highway environment and scene evidence (including undertaking scene surveys and the production of plans), as well as other environmental factors such as the weather condition, time of day and road condition at the time of collision. Vehicle damage information and crush measurements are made in order to assist in determining collision dynamics and assessing the overall severity of the collision, etc. Collision data is obtained electronically from the Event Data Recorder (EDR) or cloud data. Details of injuries are also recorded, and these are coded and ranked in line with nationally recognised best practice techniques, which allows them to be subject to later statistical analysis etc. Transport Canada's belief is that almost all of the crash reconstruction analysis they need to undertake can be accomplished retrospectively with supplied police vehicle photographs, police scene diagrams, police occupant injury information and the EDR download.

5.6 **Malta**

5.6.1 A New Transport Safety Investigation Entity

In Malta, a new multi-modal transport safety investigation entity is due to be established in 2021. This will see the merging of the existing Bureau of Air Accident Investigation (BAAI) and the Marine Safety Investigation Unit (MSIU), whilst adding road collisions to their remit (Malta has not had a railway since 1931). Although not yet operating, having gone through the process to establish the remit and structure of a new body so recently, the Maltese experience is of interest to this project.

The new safety investigation entity is to be a 100% publicly funded independent body, and will investigate collisions based on a number of criteria, including:

- incident severity.
- whether the transport means involved in the incident is public.
- overall public interest.

Their remit will include attendance at incident scenes, as well as examination of incident sites and vehicles at later dates, and conducting desktop studies. In cases where there is a judicial investigation running in parallel investigations, the judiciary will only be involved in the safety investigation process to coordinate access to the incident site and the processing of raw evidence, which may be required by both investigations (sharing evidence between the judicial and safety investigations). It is also envisaged that services of certified external metallurgical and biomedical laboratories will be required to undertake some analysis. The new agency is to have a staff headcount of 25 (of whom 56% will be management and administrators, with 44% being investigators) with the ability to call on external staff if required. The size of the organisation is significant in relation to the relatively small population and geographical scale of Malta.

The agency will be established on a 'no blame' basis for investigations, and therefore they will not have powers to prosecute. Other powers are still to be legally established, but the draft legislation gives powers to seize physical evidence, request medical tests and compel witnesses to be interviewed and require them to provide information or evidence relevant to the safety investigation. The plan is to exclude all safety investigation evidence from use in both civil and criminal courts. The new safety investigation entity will publish safety findings and safety investigation reports.

5.7 Summary of Additional Learning Points

Table 5.1 below summarises the main learning points arising from the international organisations discussed within this section of the report. These are additional to the findings of the more detailed case studies discussed in the previous section.

Table 5.1: Summary of Additional Learning Points

Private sector involvement	Although private sector involvement can facilitate getting programmes of investigation underway when governments are slow to act, there is obviously significant potential for possible conflict of interest. The independence of an investigating organisation may be compromised through involvement with companies who might have contributed to the causation (or outcome) of the incident.
Implementation of recommendations	It is important to be able to monitor the implementation of recommendations for the investigation process to have real benefit. If there are insufficient powers or influence to enforce recommendations, there is a risk that they will not be implemented.
Blame Free culture	Whilst changes to the existing legal structures of civil liability in the UK would have the potential to assist in a move towards a blame free culture, this would require a wholesale change to the current judicial system in the UK.
Thematic investigations	Whilst thematic investigations can be undertaken outwith any road collision investigation board, in the absence of sufficient powers these investigations may run into obstacles with regard to being able to acquire evidence.

6. Discussion



The above review of international road collision investigation functions and formats has highlighted several topics that may be of particular interest to RCIP and therefore would benefit from further discussion.

6.1 Purpose of investigations

In the case of fatal road traffic collisions, police investigators have duties to assist Coroners' Inquests and Procurator Fiscals undertaking Fatal Accident Inquiries. However, police led accident investigations inevitably focus on determining the course of events with a primary consideration of identifying any offences/offenders. There is the risk that, once evidence has been gathered to a point where it becomes apparent that no offences or offenders can be prosecuted, the investigation will be halted or may have difficulty in securing adequate resources and focus to continue. Some Police investigations do highlight safety issues warranting attention by other organisations. However, these aspects are not within the main police remit and resourcing limitations mean that their investigations do not typically consider deeper, underlying factors. As a result of this, safety learning opportunities are currently being missed. An independent investigation with the objective of gaining an in-depth understanding of incidents and their causation, in order to maximise learning opportunities and to reduce future risk has obvious advantages in this respect. The issue of whether the findings of such an independent investigation should also be used in criminal or civil proceedings is a complex one, but ultimately whichever path is followed, the issue must be addressed.

6.2 Investigations via permanent body or *ad hoc* research projects

The establishment of a permanent independent body with a defined remit to undertake indepth investigations would clearly require adequate funding but has considerable potential advantages over *ad hoc* projects or individual research projects in that there is no time lag in responding to individual incidents of interest, the investigation or research programme is not time limited and will not be subject to policy and/or control issues unrelated to the key aim of improving safety through a better understanding of accidents. A permanent body would also have the advantage of developing and building up institutional knowledge, skills and expertise, which is more difficult to achieve by way of individual time-limited research projects that are managed and funded in different ways and by different organisations. A new body could also allow for better continuity of understanding, increased national representativeness of cases and the ability to evolve investigations to follow leads, unconstrained by projects with narrower predetermined deliverables.

6.3 Funding investigation functions

International organisations are either fully or principally funded by central government. However, some agencies and programmes are part_funded (either monetarily or with support 'in kind') by the private sector (particularly the insurance and automotive sectors). Close partnerships with others can have significant benefits, that can be financial or involve better access to information and expertise, particularly in the areas of emerging and new technologies, where such knowledge and expertise is limited. However, this has potential implications for future budget planning as a result of the uncertainties arising from the short term fiscal pressures often experienced by private industry and the risk of potential conflicts of interest require careful consideration.

6.4 Multi-modal vs road focused investigation

Whilst nearly all organisations and programmes reported in this paper are multidisciplinary, which is essential in addressing all causes of collisions and their outcomes, many of the organisations are also multi-modal. There are potential advantages to a multi-modal body, in that there is greater support available, and the potential for experienced investigators from other modes to see incidents in the road domain with a fresh pair of eyes. In the UK, for example, the existing air, marine and rail AIBs are all members of the Accident Investigations Chiefs' Council (AICC), which assists shared learning and co-ordination, etc. One model that may provide potential benefits is that a newly formed roads investigation body could be placed within or alongside one of the existing AIBs for an initial 'incubation period', prior to it developing sufficiently to become a mature 'stand-alone' unit.

However, this approach would need to be balanced against any potential for the road domain to become 'the poor relation', missing out on resources and focus to other modes, where the individual incidents may have greater impact and exposure to public interest.

Recommendations in the other transport modes may also be easier to implement in the short term due to being a 'closed system', where the operating environment can be easily regulated and controlled. The operating environment in the road domain is more complex, and the numbers of fatalities far higher, meaning that to tackle the issue effectively it may be necessary to devote more, rather than less, resources.

6.5 Staffing and resourcing investigations

In terms of investigative resources, there are some models internationally with a large inhouse team and others with a small in-house team and a significant reliance on external resources. Whilst the latter type allows for a lower cost base and more targeted use of highly specialised experts, there is always the potential that the right expertise will not be available at the time it is most required.

There is also the issue of the use of police resources, which obviously allows for immediate deployment to incident sites, but raises the issue of what their role will be, how it may affect the focus of the investigation, and whether they have sufficient resources to be able to respond to incidents of interest to the independent investigation which would not normally meet their criteria for deployment (such as incidents resulting in minor injury only which might still be of interest to a thematic investigation).

6.6 Legal powers

Different bodies have been found to have various legal powers. Those organisations with powers to seize evidence and compel witness cooperation if required, generally reported that these powers were a great asset, even if they were not always actually applied. There is also an issue of whether investigation reports can be admissible in criminal or civil proceedings and the effect this may have on the perceived independence of the investigative body.

6.7 Investigation type

The type of investigations to be undertaken do of course determine, to some extent, the resources and structure required of an organisation. Whilst the investigation of major incidents is obviously desirable, the learnings from such incidents may be more limited in the road domain than for other transport modes. Road deaths tend to occur in smaller numbers in each incident but in greater numbers overall. For this reason, there is also a clear benefit to thematic investigations, where an incident type may be looked at in depth, including all severities of casualty, to understand where the issues lie. In the case of desk based studies, consideration should be given to whether these will be restricted in their usefulness due to police investigations—the primary data source—being too focussed on fault and blame, or whether the requirements of the study might succeed in drawing the police towards more broadly focussed investigations. In the latter case, it is likely that there may need to be both a legislative requirement placed upon the police, and adequate 'ring fenced' funding put in place.

6.8 Prioritisation of investigations

The prioritisation of incidents or incident types to investigate is also key, and will be governed by the overall remit of the organisation. For example, the remit may be limited to considering incidents which can be used to reduce the risk of death and injury from road collisions or, alternatively and as with the NHTSA in the USA, it could also consider incidents and incident types that may have a large impact on the economy. This would mean that investigations may include those incidents that cause the greatest congestion, or cause the greatest loss of economic output due to the age demographic of the casualties involved, as well as on those which cause the highest levels of death and injury.

7. Recommendations



Previous sections of this report have discussed a number of international investigation organisations, including their main aims and purposes, their structures and the scope of activity they cover. The legal framework and the existing organisational situation in the UK are unique and would likely prevent existing international models being adopted in their entirety. However, it is clear that the existing international models illustrate and include important elements that would need to be considered in the establishment of a national UK Road Collision Investigation Branch (UK RCIB). The purpose of this section of the report is to summarise the most important elements and issues that are recommended for more detailed consideration during later stages of the RCIP.

7.1 Purpose

The precise purpose, aims and scope of activity undertaken by a UK RCIB will need to be determined.

Recommendation 1

It is recommended that the purpose of a UK RCIB includes the independent investigation of road traffic collisions and other incidents occurring on the UK road network in order to identify the causes of those incidents and the factors influencing their outcomes, as well as to make recommendations aimed at reducing the occurrence and severity of future incidents.

7.2 Independence

Recommendation 2

It is recommended that a UK RCIB should be established as an impartial investigator, independent from the judicial investigation process operated by the police.

One of the issues this raises for consideration is whether or not the findings of investigations undertaken by a UK RCIB should then be allowed to be utilised during the judicial investigation process–or indeed, whether or not this could be prevented in any case. Whilst there are established principles and protocols in place for the existing investigation branches in other modes of transport, the volume and nature of prosecutions related to incidents in those modes is far surpassed by the volume of prosecutions, and related civil claims, relating to road collisions. Careful consideration will therefore need to be given as to whether or not these existing protocols can be adopted or adapted for the road domain.

7.3 Legal Powers

Recommendation 3

To ensure that a UK RCIB can function effectively, sufficient legal powers are recommended.

It is recommended that legal powers are provided to:

- investigate incidents.
- access incident sites, both while the sites are live incident scenes controlled by the police and thereafter.
- identify, collect and collate evidence (at incident scenes and elsewhere), as well as material and documentary (including medical) and electronic evidence in the possession of other organisations.
- undertake physical tests on material evidence.
- interview witnesses, including members of the response services and other investigators.

With regard to witnesses, the project team recommend that they should be compelled by law to answer questions put to them in interview with a UK RCIB, as is already the case with the other Investigation branches for other modes, with the same protections applied.

The question of precisely how a UK RCIB would link to, and operate in parallel with, the investigations undertaken by the police will require detailed consideration. However, this will involve significant operational liaison with the police at all levels of the organisation and adequate resources would need to be allocated to this function.

A UK RCIB may also need to liaise with and, at times, conduct investigations in parallel with enforcement authorities other than the police such as the Driver and Vehicle Standards Agency and the Health and Safety Executive etc.

It is also likely that, on occasion, incidents will occur that will warrant the attention of a UK RCIB as well as the AIBs of other transport modes. For example, major incidents on railway level crossings (such as that which occurred at Ufton Nervet in Berkshire) and incidents when road vehicles encroach upon other railways (such as occurred at Great Heck in Yorkshire) would require full and detailed investigation from both a roads as well as a railway perspective. Similarly, the investigation of an air crash onto a road such as the Kegworth air disaster may also have a roads component. Therefore, it is anticipated that inter-investigation branch liaison and other protocols may need to be developed, as well as liaison and a good working relationship. It is considered likely and desirable that a UK RCIB would become a member of the Accident Investigations Chiefs Council (AICC), as recommended below.

Recommendation 4

In order to operate efficiently and maximise the potential for learning, it is recommended that a UK RCIB become a Member of the Accident Investigations Chiefs' Council (AICC), which would further relationships with the existing UK Accident Investigation Branches that deal with other transport modes, as well as liaising with international counterparts.

It is also considered that international liaison should assist in the gathering of intelligence regarding new and developing issues, as well as the sharing of best practice and learning opportunities.

7.4 Scope of Activity

Recommendation 5

It is recommended that a UK RCIB undertakes multi-disciplinary investigations and is tasked with considering all relevant issues relating to the road environment, vehicle and human factors aspects of incidents and making recommendations relating to all of these aspects as appropriate.

Recommendation 6

The monitoring of progress and implementation of recommendations will be important to the success of any future UK RCIB in reducing future incidents. It is therefore recommended that consideration be given to potential mechanisms for achieving this monitoring and for identifying who would be responsible for this task

7.5 Enforceability of Recommendations

Recommendation 7

It is recommended that consideration be given to the question of whether or not recommendations made by a UK RCIB should be enforceable.

In this respect, it is considered that the overall organisational framework within which a UK RCIB operates will have a potentially significant role. For example, the Department for Transport already possesses certain enforcement powers in relation to roads, vehicles and road user licensing etc. It is clear that unenforceable recommendations are likely to have less effect than enforceable ones.

7.6 Investigation Types

Recommendation 8

It is recommended that a UK RCIB:

- investigates 'major' incidents (i.e. those of significant economic impact, as well as those involving injury and death).
- attends 'major' incident scenes as soon as practicable after the incident has occurred.
- undertakes other incident investigations at its discretion, consistent with its overall remit.and
- additionally undertakes thematic investigations.

This recommendation raises two important issues that will require detailed consideration:

- Firstly, how will a UK RCIB become aware of the incidents they will investigate? It is suggested that this intelligence is likely to be provided by the police. In the case of thematic investigations, it is anticipated that a UK RCIB will inform the police of the types of incident about which they should be informed.
- Secondly, how are 'major' incidents and relevant investigatory themes to be decided upon? It is considered likely that the definition of 'major' incidents will be externally determined and potentially standardised in line with the definitions utilised for UK investigation branches in other transport modes. However, it is recommended that a UK RCIB be allowed to determine the relevant scope for thematic investigations, although other stakeholders may wish to make recommendations in this regard.

Recommendation 9

It is recommended that a UK RCIB utilises and analyses statistical information and, for example, is granted full data access to the Department for Transport's Personal Injury Accident database (STATS19 data) and other relevant government data sources (e.g. all relevant police IT systems, coroners prevention of future death reports, etc.).

7.7 Access to Police Evidence

Recommendation 10

In addition to obtaining evidence directly from incident scenes and other organisations, it is considered important that a UK RCIB be provided with access to police road traffic collision files, including their reports, findings, notes, measurements, plans, test results and interview transcripts, etc.

It should be noted in the above regard that this access may be required some years after incidents have occurred and potentially also some years after all judicial and/or coronial investigations have been completed. In this regard, it is recommended that police forensic collision investigators (and others in the police investigation team) are trained and aware of the fact they will be collecting evidence for use by UK RCIB investigations, as well as the judicial process, and therefore elements that may be relatively insignificant from a judicial process perspective may require greater attention than they currently receive.

Recommendation 11

A UK RCIB should be allowed to question investigating police officers, as well as undertaking additional investigations of incidents that may have already been 'closed' from a police/judicial point of view.

7.8 Size and Composition

Recommendation 12

It is recognised that there are different potential models for a UK RCIB that will have a significant effect on its required staffing levels and financial budget, and it is recommended that this issue is given careful consideration.

It will be important that a UK RCIB is of sufficient size as an organisation to undertake its allotted functions, duties and tasks.

It is anticipated that the composition of the staff will be heavily oriented toward technical investigators, with specialisms in highway engineering, road traffic collision investigation and reconstruction, road vehicles and human factors, etc., and that these staff will be supported by a small administrative team.

A UK RCIB could potentially comprise a relatively small organisation, tasked with investigating a limited number of 'major' road traffic incidents and thematic investigations, and it could operate with a small team of full time investigators, calling upon external specialists from other AIBs, industry, academic establishments, research institutes and private sector organisations when required. However, a small organisation may limit the potential scope of learning that could otherwise be achieved by a larger organisation undertaking a greater number of investigations. There are also potential issues relating to the availability and independence of external specialists.

The above issues would likely be largely resolved by establishing a UK RCIB as a larger organisation. However, this would clearly have an impact on the required financial budget.

It is suggested that one model which may provide potential benefits is that a newly formed smaller UK RCIB could be placed within or alongside one of the existing AIBs for an initial 'incubation period', prior to it developing sufficiently to become a mature 'stand-alone' unit.

Recommendation 13

It is recommended that if a UK RCIB organisation is initially established as a relatively small organisation, it should have the potential to grow significantly in size as its role develops and as the other organisations with which it must liaise and co-operate adjust to its presence.

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Appendix A

International organisations contacted as part of the study and their response

Country	Information from contact	Information from web/ papers	Organisation	Organisation Website	Scope includes Road Collisions	Multi- Modal	On-Scene Investigations	Desk-Top Investigations	Thematic Investigations	Research Studies	Statutory Powers	Notes of Interest	Population (millions)	KM of roads (thousands)	Number of Vehs (thousands)	Road Deaths	Deaths per 100,000 population
Australia*	Yes	Yes	No national body in existence	N/A	Yes	No	No	Yes	No	Yes	No	Highways authorities leading developments	25.5	877.6	19,800	1,200	4.71
Austria	No	No	None identified	N/A							Not applica	ble					
Bosnia- Herzegovina	No	No	None identified	N/A							Not applica	ble					
Canada	Yes	Yes	Transport Canada operating the Directed Studies Initiative	https://www. tc.gc.ca/en/ transport- canada.html	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Sets standards and involved in recalls	37.7	1042	25,060	1,900	5.04
Canada	Yes	Yes	Transportation Safety Board	https://www. tsb.gc.ca/	No	Yes	N/A	N/A	N/A	N/A	N/A	Will make recommendations on roads and road vehicles related to road/rail interface					
Croatia	Yes	No	None identified	N/A		Not applicable											
Cyprus	Yes	No	None identified	N/A							Not applica	ble					
Czech Republic	No	No	None identified	N/A							Not applica	ble					
Denmark	Yes	Yes	HVU	http://www. hvu.dk	Yes	No	Yes	Yes	Yes	Yes	Yes		5.8	90	3,035	200	3.45
Finland	Yes	Yes	SIAF	https://www. turvallisuust utkinta.fi/									5.5	79	2 120	210	2 92
Finland	Yes	Yes	ОТІ	https://oti.fi/	Yes	No	Yes	Yes	Yes	Yes	Yes	Powers to collect and use data for safety purposes	3.0	10	3,130	210	0.02
France	No	Yes	BE-ATT	http://www.be a-tt.developpe ment-durable. gouv.fr/	Yes	Yes	Yes	Yes	No	No	Yes		65.3	1,103	39,910	3,240	4.96

Country	Information from contact	Information from web/ papers	Organisation	Organisation Website	Scope includes Road Collisions	Multi- Modal	On-Scene Investigations	Desk-Top Investigations	Thematic Investigations	Research Studies	Statutory Powers	Notes of Interest	Population (millions)	KM of roads (thousands)	Number of Vehs (thousands)	Road Deaths	Deaths per 100,000 population
Germany	Yes	Yes	BASt and FAT, operating GIDAS	https://www. gidas.org/	Yes	No	Yes	Yes	Yes	Yes	No		83.8	644	50,847	3,060	3.65
Greece	No	No	None identified	N/A							Not applicabl	e					
Hungary	No	No	None identified	N/A							Not applicabl	e					
India	Yes	Yes	JPRI operating RASSI	http://www. rassi.org.in/	Yes	No	Yes	Yes	Yes	Yes	No		1,380	5,898	253,311	149,000	10.80
Israel	No	No	None identified	N/A							Not applicabl	e					
Italy	No	No	None identified	N/A							Not applicabl	e					
Malaysia	No	Yes	MIROS	http://miros. gov.my/	Yes	No	No	Yes	Yes	Yes	No		32.4	250	31,200	5,870	18.12
Netherlands	Yes	Yes	ow	https://www. ond erzoeksraad. nl/	Yes	Yes	Yes	Yes	Yes	No	Yes		17.1	139	9,961	660	3.86
New Zealand	Yes	Yes	NZ Police	https://www. police.govt. nz/about-us/ structure/ teams-units/ road-policing	Yes	No	Yes	No	No	No	Yes		4.8	94	4,596	350	7.29
Norway	Yes	Yes	SHT	https://havari kommisjonen. no/	Yes	Yes	Yes	Yes	No	No	Yes		5.4	95	3,331	110	2.04
Poland	No	No	None identified	N/A							Not applicabl	e					
Portugal	No	No	None identified	N/A							Not applicabl	e					
Romania	Yes	No	None identified	N/A							Not applicabl	e					
Serbia	Yes	No	None identified	N/A							Not applicabl	e					

Country	Information from contact	Information from web/ papers	Organisation	Organisation Website	Scope includes Road Collisions	Multi- Modal	On-Scene Investigations	Desk-Top Investigations	Thematic Investigations	Research Studies	Statutory Powers	Notes of Interest	Population (millions)	KM of roads (thousands)	Number of Vehs (thousands)	Road Deaths	Deaths per 100,000 population
Slovakia	No	No	None identified	N/A				-		-	Not applicabl	e					
Slovenia	No	No	None identified	N/A							Not applicabl	e					
Sweden	Yes	Yes	SHK	https://www. havkom.se	Yes	Yes	Yes	Yes	No	No	Yes		10.1	215	5,541	220	2.18
Switzerland	No	No	None identified	N/A							Not applicabl	e					
UAE	No	No	None identified	N/A							Not applicabl	e					
Ukraine	Yes	No	None identified	N/A							Not applicabl	e					
USA	No	Yes	NTSB	https://www. ntsb.gov/	Yes	Yes	Yes	Yes	Yes	Yes	Yes		221.0	6.607	007 000	26 100	10.01
USA	No	Yes	NHTSA	https://www. nhtsa.gov/	Yes	No	Yes	Yes	Yes	Yes	Yes		- 331.0	0,097	287,300	30,120	10.91
USA	Yes	Yes	СНР	https://www. chp. ca.gov/find- an- office/ headquar ters/ assistant-com missioner- staff/collision- investigation- unit/ multidisciplin ary- accident- investig ation-teams	Yes	No	Yes	No	No	No	Yes		39.8	315	36,174	3,540	8.89

Appendix B

Questionnaire sent out to international organisations as part of the study

General									
Organisation responsible for road safety:									
Year organisation became responsible for investigating roa	d collisions:								
Is your organisation completely independent or part of trans Please state which organisation if not completely independ	sport department dent.	/police/other?							
Is your organisation responsible for investigation in other modes (air/rail/marine) or areas of safety (e.g. industrial)	YES	NO							
Investigations									
How do you decide which incidents to investigate?									
Do your investigations include:									
Desktop Studies?	YES	NO							
Attendance at Incident Scene?	YES	NO							
• Examination of incident sites and vehicles at a later date?	YES	NO							
Involvement from other agencies? YES NO									
If your investigations include involvement from other agence organisations and explain the specialisms most commonly	cies, please name v needed.	e those							
Staff Resources									
How many (full time equivalent) staff do you have?									
What approximate percentage of these are:									
Managers/administrators									
Technical Specialists/Investigators									
Do you also have the ability to call on external staff?	YES	NO							
If YES, what approximate percentage of hours worked are	by these externa	al staff?							
How many geographic locations are your staff based at?									

What is the source of your funding? (if a mixture, please state proportions- e.g. 60% public, 40% private)What is the total budget of your organisation for Road Traffic Incident Investigations? (state currency)If there is no set budget, please provide approximate spend on this field of investigation in an average year (state currency)	Budget	Budget
What is the total budget of your organisation for Road Traffic Incident Investigations? (state currency) If there is no set budget, please provide approximate spend on this field of investigation in an average year (state currency)	What is the source of your funding? (if a mixture, please state proportions- e.g. 60% public, 40% private)	ource of your funding? (if a mixture, please ons- e.g. 60% public, 40% private)
If there is no set budget, please provide approximate spend on this field of investigation in an average year (state currency)	What is the total budget of your organisation for Road Traffic Incident Investigations? (state currency)	otal budget of your organisation for Road It Investigations? (state currency)
	If there is no set budget, please provide approximate spend on this field of investigation in an average year (state currency)	et budget, please provide approximate field of investigation in an average year y)

Powers		
Do you have:		
 Powers to seize physical evidence? (vehicles, infrastructure, documents) 	YES	NO
• Powers to force witnesses to be interviewed?	YES	NO
 Powers to force witnesses to answer questions? (no right to silence) 	YES	NO
Can your investigations and evidence be used in criminal prosecutions?	YES	NO
Can your investigations and evidence be used in civil liability (compensation) cases?	YES	NO
Does your organisation have its own powers to prosecute?	YES	NO

What other powers do you have (if any)?

Outcomes		
Have your investigations ever resulted in a change in government policy?	YES	NO
Have your investigations ever resulted in a change in industry standards?	YES	NO
Have your investigations ever resulted in a change in the law?	YES	NO
What other outcomes have you seen from your investigations (if any)?		



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