

## **CEDR Transnational Road Research Programme Call 2013: Traffic Management**

funded by  
Belgium-Flanders, Denmark, Finland,  
Norway, UK and Netherlands



# **PRIMA – Pro-Active Incident Management**

## **Stakeholder Consultation report**

Deliverable D2.1  
February 2015



# **CEDR Call 2013: Traffic Management PRIMA Pro-Active Incident Management**

## **Stakeholder Consultation Report D2.1**

Due date of deliverable: 01/31/2015  
Actual submission date: 03/02/2015

Version	Date	Comments
0.1	17.12.14	First draft and structure (based on limited response data)
0.2	14.01.15	Ongoing updates as more responses are received
0.3	28.01.15	Additions requested by AIT, plus disaggregated charts
0.4	10.02.15	Updated with contributions from all PEB members
0.5	11.02.15	Revisions following technical review
0.6	11.02.15	Inclusion of Slovenia response
0.7	18.02.15	Email response received from Strassen NordRhein-Westfalen
0.8	25.02.15	Final pre-review version
0.9	25.02.15	Review by AIT
1.0	25.02.15	Final version
1.1	26.02.15	Reformatted

**Author of this deliverable:**  
Nicholas Taylor, TRL

PEB Project Manager: Erik De Bisschop, Belgium

Version: 1.1

## Table of contents

1	Introductory note	1
2	Stakeholder Survey	2
2.1	Summary of Stakeholders and Survey content	2
2.2	Responses and analysis	4
3	Discussion and conclusions	12
4	Acknowledgements	13
5	References	14
6	Appendix – PRIMA Web Survey Questionnaire	15

# 1 Introductory note

The purpose of the PRIMA project (PRIMA 2015), which forms part of CEDR's Call 2013 Programme, is broadly to analyse the risks and costs of managing road traffic incidents. Traffic Incident Management (TIM) methods and best practice have been studied in previous CEDR and other programmes. PRIMA aims also to update these studies by analysing pro-active measures which envisage the use of technology or methods such as optimal response timing to enhance the performance of traffic incident management.

This is PRIMA Deliverable 2.1, Stakeholder Consultation Report, and is additional to the main Work Package 2 Report D2.2. This document reports the results of an online Questionnaire Survey distributed to a number of Stakeholders in Europe known or expected to have an interest in Traffic Incident Management (TIM), including representatives of National Road Administrations (NRA) and members of the CEDR Programme Executive Board (PEB), with the purpose of identifying incident scenarios, methods and technologies relevant to pro-active TIM. The Survey consisted of a single web page designed to be simple to complete while covering the range of required issues. This report is organised as follows: summary of stakeholders canvassed, summary of questions asked, responses and analysis, discussion and conclusions. The Survey Questionnaire is given in the Appendix.

## 2 Stakeholder Survey

### 2.1 Summary of Stakeholders and Survey content

A total of 100 potential Stakeholders have been approached by email explaining the purpose of the project and including a link to a single-page online questionnaire built using Google Forms. Where appropriate question numbers are indicated in square brackets. The distribution of organisation types approached and responding is given in Table 1, while Table 2 gives the distribution of invitations and responses by country. It is important to note that the number of invitations can include more than one person per organisation. Hence, the questionnaire was often jointly completed for one organisation, which explains the low number of responses compared to the number of invitations.

**Table 1. Distribution of Stakeholder types invited to participate in Questionnaire Survey**

Organisation Type	Invited	Responded	Substituted	Non-responding
Government Body	60	13	27	21
Consultant / Contractor	20	2	6	11
Local / Regional Authority	16	3	0	14
Professional Body	3	0	0	3
Police Administration	2	0	0	2
<b>TOTAL</b>	<b>102</b>	<b>18</b>	<b>33</b>	<b>51</b>

**Table 2. Distribution by country of Stakeholders invited to participate in Survey and respondents**

Country	Number of invitations	Number of responders
Sweden	14	2
Austria	14	1
Ireland	12	1
The Netherlands	9	5
Belgium	8	1
England	7	1
Italy	6	0
Norway	5	1
Finland	4	1
The Czech Republic	4	0
Denmark	3	1
France	3	0
Slovenia	2	1
Germany	2	1

Estonia	2	0
Australia	1	1
USA	1	1
Bulgaria	1	0
Hungary	1	0
Luxembourg	1	0
Spain	1	0
Switzerland	1	0
<b>TOTAL</b>	<b>102</b>	<b>18</b>

The Survey questions are given in the Appendix, divided into five groups plus respondent's details. The questions aim to establish the role and general concerns of the Stakeholders as well as identifying areas relevant specifically to pro-active incident management. Many of the general issues were covered by the previous CEDR Task 5 and Task 13 studies. Of particular interest to PRIMA are the incident scenarios, performance measures and innovative technologies.

The types of questions asked are summarised below.

- Role of organisation (Network Manager etc.)
- Extent of responsibility (e.g. whole network, critical points like tunnels etc.)
- Relevant incident scenarios (12 options plus 'Other') ranked by importance
- Specific procedures (e.g. for Large Goods Vehicles (LGVs), spills etc.)
- Communications and coordination between responders
- Guidelines shared by responders
- Performance measures (7 options plus 'Other') ranked by importance, and any related issues
- Incident data and dissemination of information
- Novel and useful technologies for pro-active TIM (8 suggestions plus 'Other'), and constraints

Where 'Other' was selected, respondents were invited to describe an alternative option.

Several of the questions are multiple choice where only one option is allowed, for example definition of the organisation's role. Others are in matrix form where a number of issue or measures can be ranked in terms of importance or priority. In all these cases, an 'Other' option is available and text comments can be added to qualify the response. The analysis concentrates on quantifiable results.

## 2.2 Responses and analysis

Seventeen individual responses (including two from the same individual in the Netherlands Rijkswaterstaat (RWS) 'wearing different hats'), plus one email reply giving limited information (from Strassen NordRhein-Westfalen (NRW)), have been received, representing thirteen countries out of 22 approached. The responses are of high quality, and include all members countries of the PEB, but it is disappointing that despite repeated requests several countries prominent in previous CEDR projects are not represented. Because of their large instrumented networks and multiple roles, the multiple inputs from the RWS (total of six divided 4:2 between the roles of Network Manager and Incident Manager Only) and the single contribution from English Highways Agency (HA) have each been weighted 2 overall.

Using the definitions in the CEDR Task 13 report (see also introduction to Question 1.1), the roles and responsibilities of the respondents are given below. Subsequent tables and figures summarise the results.

**Table 3. [Q1.1] Responding organisations' roles in TIM (rank order)**

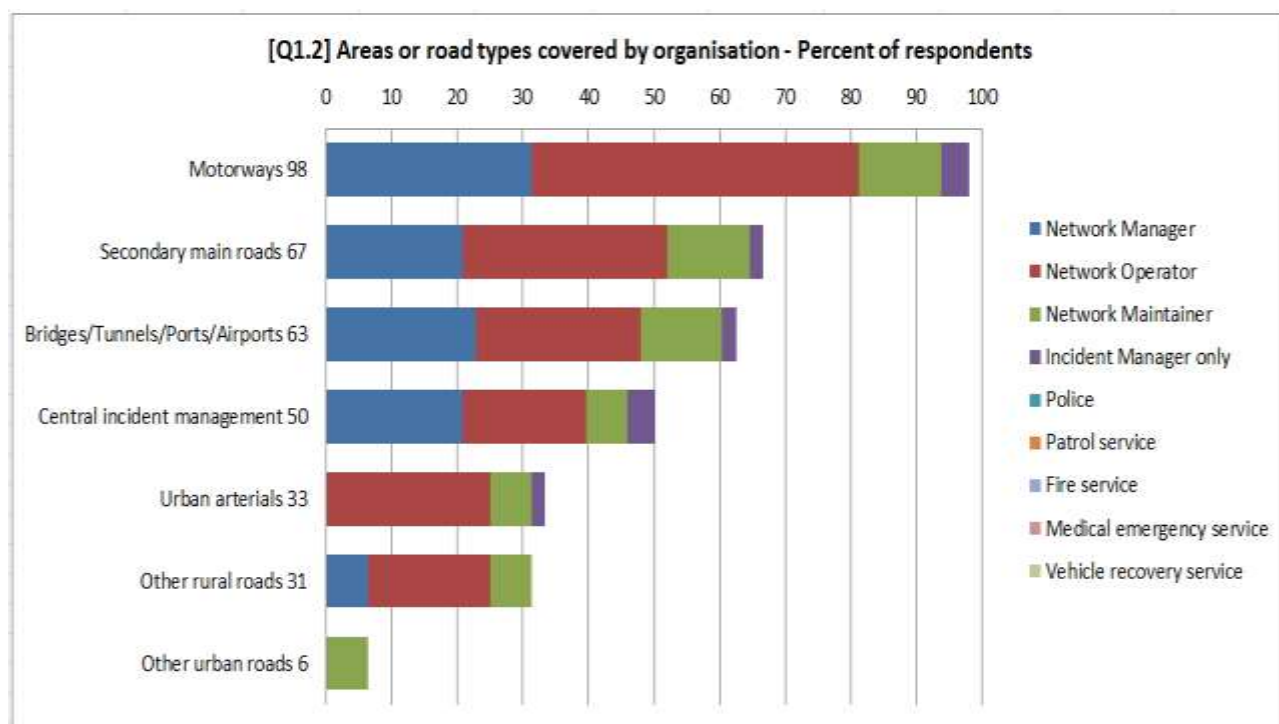
<b>Respondent's role</b>	<b>Weighted number of responses</b>
Network Manager	5.3
Network Operator	8
Network Maintainer	2
Incident Manager Only	0.7
Police	0
Patrol service	0
Fire service	0
Medical emergency service	0
Vehicle recovery service	0
<b>TOTAL (weighted)</b>	<b>16</b>

### **Note on interpretation of bar charts**

Respondents are weighted as described above, not according to number of responses per organisation. In some cases multiple choices were available (e.g. for areas of responsibility, Figure 1). None of the bars extends to 100% because at least one organisation did not provide a full response. Figures attached to the category titles at the left represent within-response weightings used to rank the categories where the overall percentage response does not vary. In ranking importance, the convention adopted is that 'Very important' is weighted 10, 'Quite important' 5, 'Quite unimportant' 2, and 'Not important at all' or 'N/A' or 'don't know' zero. In ranking priority, 'In use already' is weighted 10, 'Plan to implement' 7, 'Would help to implement' 5, 'No plans to use at this time' 2, and 'Don't Know or unaware of technique' zero.

Within their overall role, each respondent may have several specific areas of responsibility, which are collected in Figure 1. Not surprisingly, motorways or the equivalent have the highest representation at 98%, followed by other main roads at 67% (the Questionnaire did not identify 'primary' or 'strategic' roads separately) and critical points in the network at 63%. Half of respondents identify Central Incident Management as a role, but only a small fraction identify themselves as Incident Managers only. For motorways and major roads, Network Managers and Network Operators have broadly similar representation, but the former are

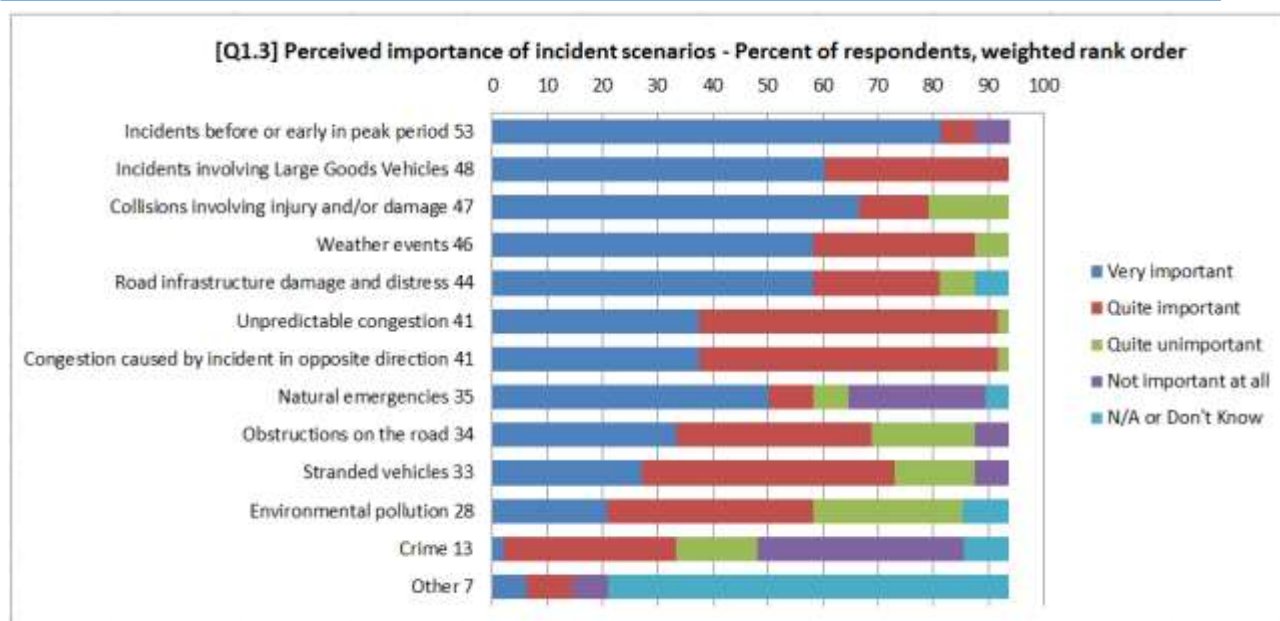
much less concerned with urban or other roads. The pattern appears generally similar to that among the major contributors to Task 13. In many countries there is no formal role of Network Management or Central Incident Management, and in many cases incidents are handled by the Police, making it seem less likely that pro-active measures aimed at a coordinated multi-agency type of TIM would be implemented.



**Figure 1. [Q1.2] What areas or road types does your organisation cover?**

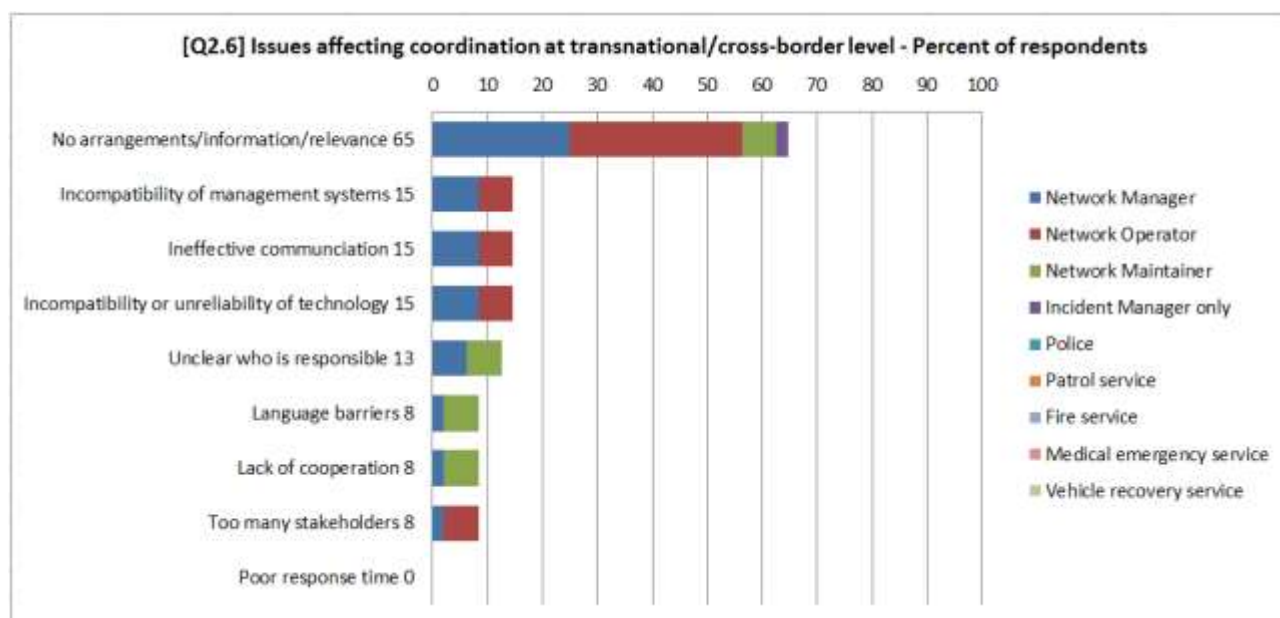
Figure 2 shows the ranked order of incident types, with incidents before or early in the peak period and incidents involving Large Goods Vehicles being of the most concern, although all significant incidents and weather events are highly ranked. As explained above, the multiple-choice nature of the question in this case results in all the bars being of equal length but varying in their distribution of importance ranking. However, it is clear that almost all common forms of incident are considered important, and by their nature it is evident that disruption and delay are major concerns of respondents.





**Figure 2. [Q1.3] Relevant incident scenarios (ranked by weighted responses)**

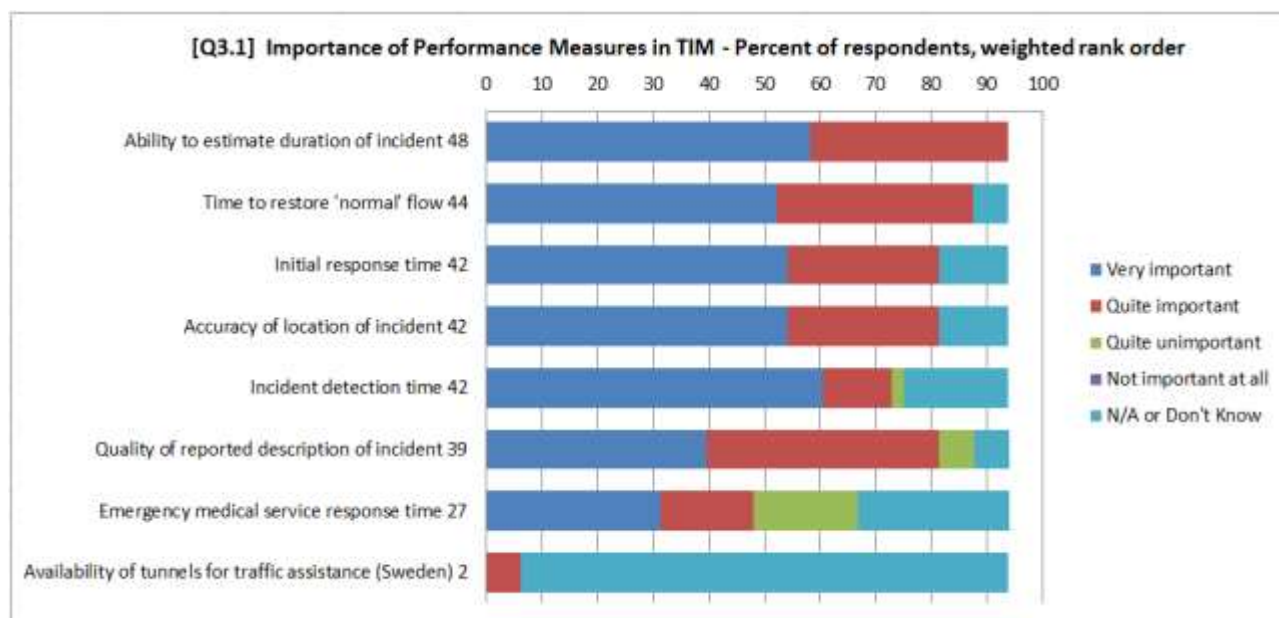
Figure 3 shows that most of the respondents are not concerned about transnational coordination. Where respondents do have an interest, their main concern is incompatibility of systems with some concern that it is unclear who is responsible. One respondent commented that it is very important to “be able to cooperate with police and other rescue vehicles to maintain traffic flow through an accident site”.



**Figure 3. [Q2.6] What if any issues have you experienced in coordinating at transnational level?**

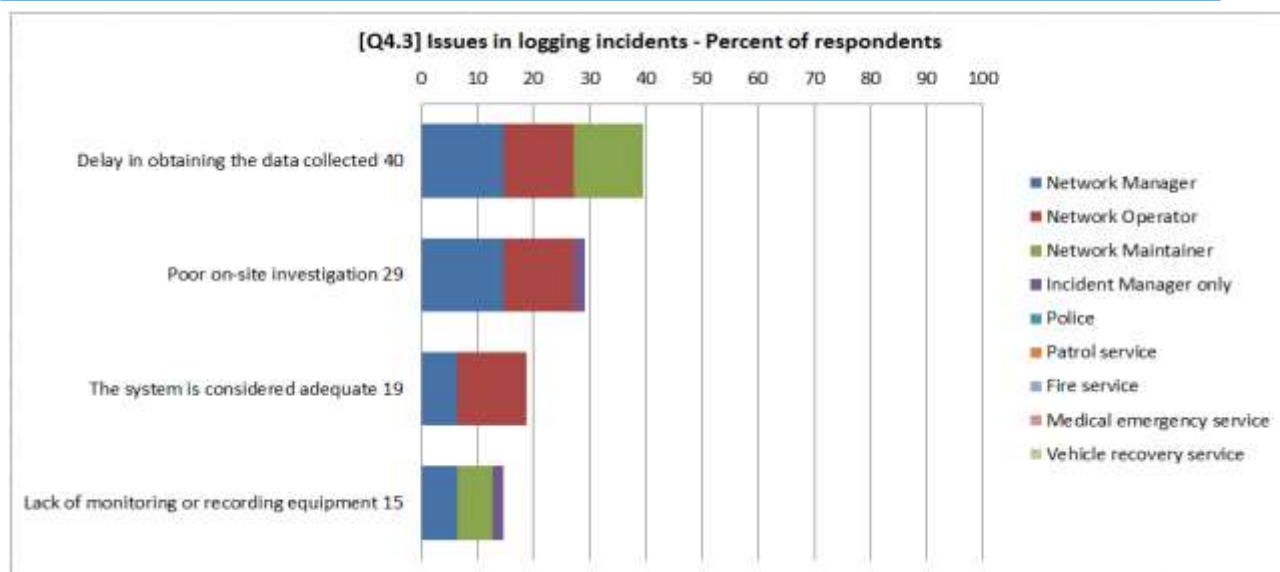
Figure 4 shows that nearly all respondents reported using performance measures. However, only 58% indicated that they have performance targets. Problems mentioned included

incomplete recording of data, methods difficult to apply, and conflicting interests. The most highly ranked performance measures are ability to estimate duration, and restoration and response times, followed closely by accuracy, timeliness and quality of alerts.



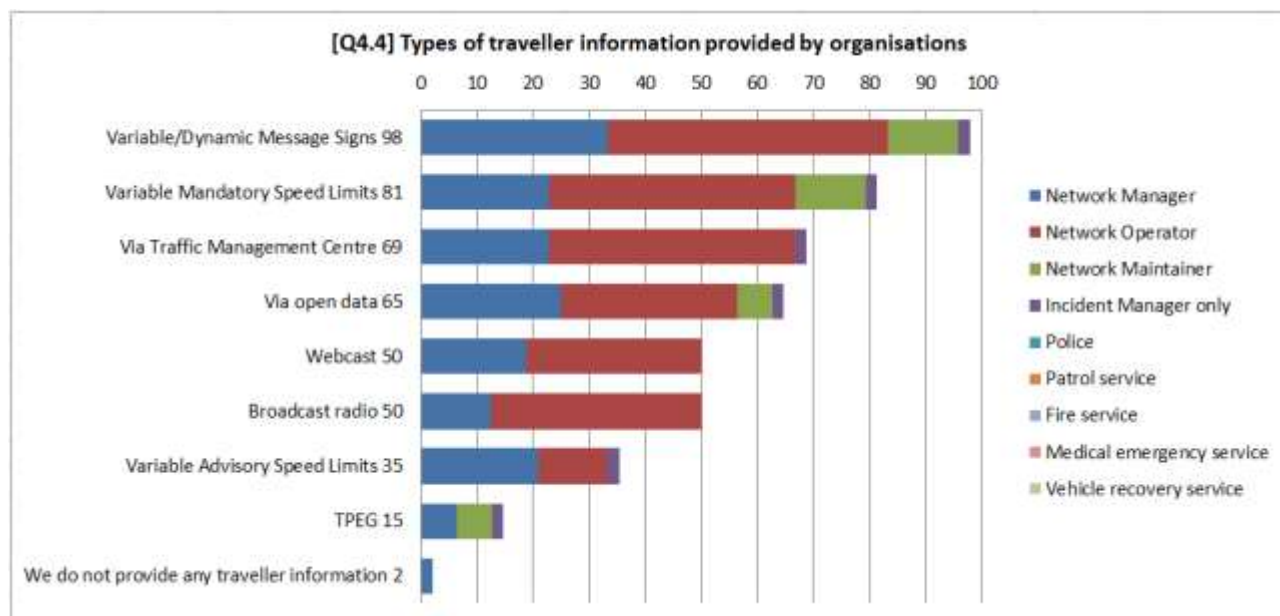
**Figure 4. [Q3.1] Importance of Performance Measures for dealing with incidents**

Figure 5 shows that respondents did not have strong views concerning logging of incidents. However, the ability to obtain reliable statistics and identify significant factors in incidents is essential for identifying possible areas for improvement. All respondents log incidents involving injury or death, except TrafikVerket in Sweden where the Police are responsible for this, and over 80% log incidents involving LGVs or hazardous substances. However, only 20% of respondents report that their logging systems are adequate, with the remainder identifying one or more of the issues. One respondent commented that “logging costs a lot of time. Further automation and sharing of data would make this easier”.



**Figure 5. [Q4.3] What if any issues have you experienced in logging incidents?**

Figure 6 shows that all respondents, except RWS Central Incident Management, said they provide traveller information. Not surprisingly, Variable Message Signs (VMS) top the list, and Variable Mandatory Speed Limits (VMSL) are playing an increasing role since first introduced in the England in 1995 and in the Netherlands in the mid-1990s. The overall picture is that the responding organisations rely mainly on centralised provision and distribution of information.



**Figure 6. [Q4.4] What traveller information does your organisation provide?**

Figure 7 ranks innovative technologies and techniques, with Figure 8 charting reasons for not employing novel technologies. The main reason given for not employing a novel technology is lack of a budget, followed by unknown benefit and difficulty of integrating with existing systems. However, Norway says it would like to deploy more incident detection in tunnels. Passive measures include incident screens to discourage passers-by from being distracted or rubber-necking, scene protection, e.g. robust vehicles fitted with lane-change signs, and provision for coning or other lane protection.

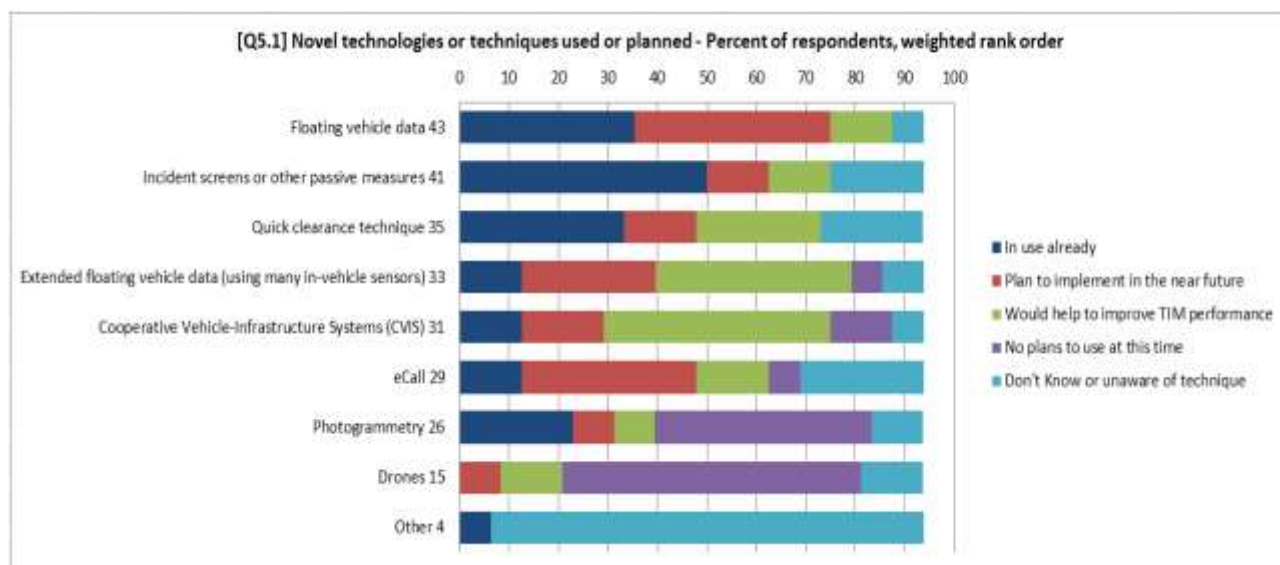


Figure 7. [Q5.1] What novel technologies or techniques do/would you use in TIM?

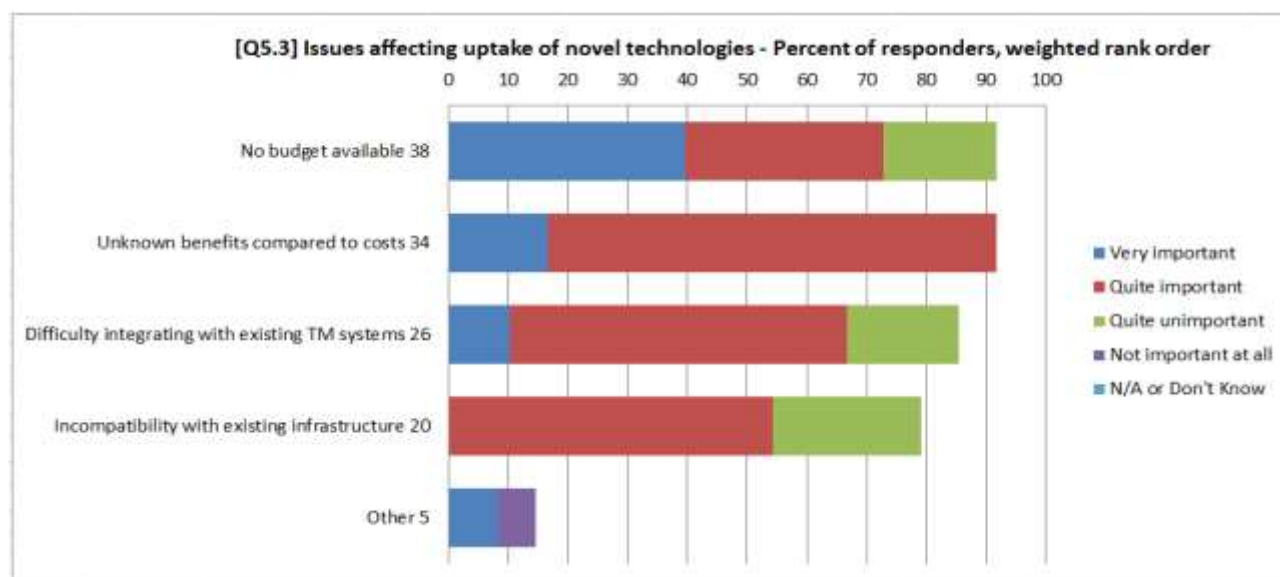


Figure 8. [Q5.3] What issues have you experienced in uptake of novel technologies?

A summary of positive responses to some qualitative questions is given in Table 4. Responses are expressed in terms of percentages assessed 'manually' because the verbal answers are not directly comparable, and some respondents indicate that general procedures include some special situations.

**Table 4. Weighted percentage of positive responses to questions with text box answer only**

Question	Topic	Percent
2.1	Specific procedures or guidelines for TIM	94
2.2	Procedures for incidents involving LGVs	48
2.3	Procedures for incidents at tunnels and bridges	83
2.4	Procedures for dealing with hazardous materials	60
2.5	Action if TMC to roadside infrastructure communication is lost	75
2.7	Potential for improving procedures or guidelines	60
3.2	Proportion of respondents with performance targets	58
3.4	High-level strategic plan	44
4.3	Issues experienced with regard to logging incidents	88
5.3	Issues with regard to uptake of novel technologies	15

Where performance targets are specific they tend to relate to response or clearance times, and there are considerable differences that obviously relate to the nature of the network, with shorter response times tending to be associated with denser and more urbanised networks.

The HA and RWS say they focus mainly on restoring traffic flow, as well as safety including medical response within the 'golden hour' and avoiding secondary accidents. The HA refers to the Incident Response section of its Asset Management Operational Requirements (AMOR 2011), which gives detailed instructions for responding to different types of incident with average response time in the range 30-60 minutes from incident notification to production of an Incident Response Plan (note that this assumes emergency services can already be on the scene), and 50-120 minutes from lane closure or handover by emergency services to lane re-opening, but mentions that it is considering re-prioritising response time. The RWS has a target to reduce handling time by 25%.

TrafikStockholm specifies a 5 minute response time for road assistance (VägAssistans) vehicles in tunnels, 12 minutes from discovery until road assistance vehicles arrive at incident, and 20 minutes for tow-trucks.

The State of Victoria specifies attendance at 80% of incidents within 15 minutes, and clearance of 50% of incidents within 15 minutes of notification.

In the Republic of Ireland, required response time varies from 30-120 minutes depending on the nature of the incident, but the NRA aims to release information about the incident within 10 minutes.

In Denmark, the Police have charge of the incident scene and its clearance, and Vejdirektoratet has only a supporting role.

NordRhein-Westfalen first offered to complete the Questionnaire manually, but subsequently responded by email saying that the Police handle incidents but Strassen NRW provides traffic control and travel information services. Among other countries with major motorway systems, responses from StradeANAS in Italy, ASTRA in Switzerland, various bodies in France, and one in Spain were not obtained.

Further data can be found in the Task 13 report CEDR (2011) or the paper by Steenbruggen *et al* (2012) based on it.



### 3 Discussion and conclusions

Although this survey has received only an 18% individual response rate, in many cases several individuals from the same organisation or country were approached and if these duplications are excluded the response rate improves to 26%, with 59% of the countries approached being represented, notable exceptions being France, Italy, Spain, and also Switzerland, which was added at a later stage. The respondents include all the countries represented in the PEB, and is believed to include all those NRAs that would describe themselves as Network Managers, namely England, the Netherlands, the Republic of Ireland and Sweden.

The results show a consistent pattern with the emphasis on motorways, and no single issue or technique in any category being completely dominant. For example, incidents before or early in a peak period are ranked highest in importance, but those involving LGVs and other incidents involving injury or damage or weather events are also closely ranked. In managing incidents, accurate duration estimation, time to restore normal flow, and response time are ranked highest, but having accurate location information and description are nearly as important.

All respondents (except NRW as far as is known) have procedures or guidelines for TIM, and about two-thirds on average have special procedures for particular situations with bridges and tunnels having the highest priority. Sixty percent recognise there is potential for improvement and describe performance targets, and nearly half have or are developing strategic plans (including three of the Network Managers). Areas that raise issues are logging of incidents, and potential transnational/cross-border arrangements in the few cases where these are of concern.

The most popular ways of providing traveller information are VMS and VMSL, followed by TMC provision and 'open data', which are broad concepts but can be interpreted as providing information to the Media for dissemination by whatever means are at their disposal. Half of respondents use web and radio broadcasts, but TPEG so far has only limited (15%) penetration.

The most desirable (novel) techniques are having access to floating car (i.e. real time) data and passive measures such as incident screens and scene protection or coning at the ready (deployed already by nearly half of respondents). Quick clearance techniques are also highly ranked, although to date it has been implemented mostly in the USA where the necessary legal provisions exist in about half of the States. Perhaps surprisingly, eCall achieves only a modest ranking, as does photogrammetry (laser scanning) although it is mainly an investigative tool.

In conclusion, apart perhaps from the lowish importance ascribed to eCall, there are no major surprises, and the results are compatible with the issues highlighted in the main WP2 Report (Taylor *et al* 2015).

## 4 Acknowledgements

We are very grateful to those who went to the trouble of responding to our survey and provided useful and detailed data. We wish to thank the following organisations and their representatives (in alphabetical order):

ASFiNAG (Austria)

DARS (Slovenia)

Finnish Transport Agency (Finland)

Hamon Contractors, Inc (Colorado USA)

Highways Agency (England)

Mobiliteit en Openbare Werken (Belgium-Flanders)

National Roads Authority (Republic of Ireland)

Rijkswaterstaat and Professor Ben Immers (Netherlands)

Statens vegvesen (Norway)

Strassen NordRhein-Westfalen (Germany)

Trafik Stockholm (Sweden)

Trafikverket (Sweden)

Vejdirektoratet (Denmark)

VicRoads (Australia)



## 5 References

AMOR (2011). *Area 10 AMOR Version 1.7*. July 2011. [http://assets.highways.gov.uk/about-us/procurement-asset-support-contract/Area\\_10\\_AMOR\\_v1\\_7.pdf](http://assets.highways.gov.uk/about-us/procurement-asset-support-contract/Area_10_AMOR_v1_7.pdf) [Accessed 10 February 2015]

CEDR (2011). *Best Practice in European Traffic Incident Management*. Report of Task 13. Conference of European Directors of Roads, March 2011, Paris. <http://www.cedr.eu>

PRIMA (2015). *Pro-Active Incident Management*. CEDR Transnational Road Research Programme: Call 2013. [http://www.eranetroad.org/index.php?option=com\\_content&view=article&id=139&Itemid=181](http://www.eranetroad.org/index.php?option=com_content&view=article&id=139&Itemid=181)

Taylor N B, Nitsche P, van Rooij L, Bernhardsson V, Mocanu I and Olstam J (2015). *Report on best practice, needs and derived incident scenarios*. PRIMA Deliverable D2.2.

Steenbruggen J, Kusters M and Broekhuizen G (2012). Best practice in European traffic incident management. Transport Research Arena – Europe 2012. *Procedia – Social and Behavioural Sciences* 48 (2012), 297-310. Elsevier.

## 6 Appendix – PRIMA Web Survey Questionnaire

### PRIMA Proactive Traffic Incident Management (TIM) Survey

\* Required

#### [Part 1 of 6] INTRODUCTION

The aim of the CEDR programme is to realise the benefit of implementing innovation in traffic management solutions for National Road Administrations (NRAs). The PRIMA project seeks to identify areas in which of current state-of-the-art Traffic Incident Management (TIM) techniques could be further enhanced through the introduction of Pro-Active Incident Management. This Questionnaire forms part of a formal stakeholder consultation exercise to ensure that the project focus is aligned with the needs of the potential users. \*\* Please do not enter any data in the small text boxes below the Section Headings. A box is provided at the end of this Questionnaire for any general comments concerning TIM or this survey \*\*

#### 1.1 Your organisation's role in Traffic and Incident Management\*

The three Network roles are defined as follows: NETWORK MANAGER: plays a direct role in incident management; leads scene management (similar to or shared with the police and/or emergency services); minimises network disruption from incidents. NETWORK OPERATOR: coordinates incident response; detects incidents using various technologies; directs responders to the scene; informs road users through signage or other media. NETWORK MAINTAINER: ensures roads are cleared after incidents; returns the infrastructure to operating standard; reviews the safe use of the network; makes corrective infrastructure changes to reduce incidents. INCIDENT MANAGER is a specific role to manage only incidents (e.g. at national level). **PLEASE CHOOSE ONE ONLY**

- ☐ Network Manager
- ☐ Network Operator
- ☐ Network Maintainer
- ☐ Incident Manager only
- ☐ Police
- ☐ Patrol service
- ☐ Fire service
- ☐ Medical emergency service
- ☐ Vehicle recovery service
- ☐ Other:

#### 1.2 What areas or road types does your organisation cover?\*

**PLEASE INDICATE ALL THAT APPLY**

- ☐ Central incident management
- ☐ Bridges/Tunnels/Ports/Airports
- ☐ Motorways
- ☐ Secondary main roads
- ☐ Other rural roads

☐ Urban arterials

☐ Other urban roads

☐ Other: 

### 1.3 Relevant Incident Scenarios\*

Please rate the importance for your operations of the following types of incidents (where applicable).

**PLEASE CHOOSE ONE IMPORTANCE VALUE FOR EACH TYPE OF INCIDENT**

	Very important	Quite important	Quite unimportant	Not important at all	N/A or Don't Know
Collisions involving injury and/or damage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incidents before or early in peak period	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incidents involving Large Goods Vehicles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weather events (e.g. fog, ice)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stranded vehicles (breakdowns)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Congestion caused by incident in opposite direction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obstructions on the road (e.g. debris, animals, substances)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crime (e.g. traffic offences, car chases, terrorism)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Road infrastructure damage and distress (e.g. pavement, walls)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unpredictable congestion (any cause)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental pollution (e.g. involving Hazardous Materials)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Natural emergencies (e.g. floods, landslides)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Very important	Quite important	Quite unimportant	Not important at all	N/A or Don't Know
Other (please describe under next Question - otherwise select N/A)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### 1.4 Please define and rank any Incident Scenarios not listed above.

If there is only one such scenario, you may use the 'Other' ranking buttons above.

### [Part 2 of 6] CURRENT TIM PROCEDURES AND PRACTICE

The following questions relate to current TIM procedures and practice and give you the opportunity to provide free descriptions of links to documentation. If you do not have specific procedures for the type of incident referred to by a question, please feel free to comment on this (e.g. if you feel they are not necessary). \*\* Please send any relevant documents directly to [ntaylor@trl.co.uk](mailto:ntaylor@trl.co.uk) \*\*

#### 2.1 Please indicate whether you have specific procedures or guidelines for TIM, and if so please describe them and give links if appropriate, indicating whether they are used in daily operation.\*

#### 2.2 Do you have special procedures or guidelines for dealing with incidents involving Large Goods Vehicles?

While this may be covered by your general procedures, LGV incidents are considered to be a significant factor in incident severity and duration, and it will be useful to have information that is specific to them if available.

#### 2.3 Do you have special procedures or guidelines for tunnel (or bridge etc.) incidents? If so please describe them.

Tunnel incidents are often of particular concern because of the risk of entrapment and fire. Please describe any arrangements you have for such critical facilities.

#### 2.4 Do you have special procedures or guidelines for dealing with incidents involving hazardous materials or cargoes?

Apart from events like chemical spills, propane etc, this could include diesel spills. Another possible scenario is spillage of a valuable perishable cargo. If you have special procedures please describe them and identify any substances of particular concern.

#### 2.5 What action if any do you take if communication between a traffic control centre and roadside infrastructure is lost?

**2.6 If you have transnational (cross-border) coordination agreements, e.g. for handover between different organisation, please indicate what if any issues you have experienced in coordinating incidents at a transnational level:\***

**PLEASE INDICATE ALL THAT APPLY**

- ☐ Not relevant to our operations
- ☐ Language barriers
- ☐ Ineffective communication
- ☐ Incompatibility of management systems
- ☐ Incompatibility or unreliability of technology, communications etc
- ☐ Unclear who is responsible
- ☐ Too many stakeholders
- ☐ Lack of cooperation
- ☐ Poor response time
- ☐ Other:

**2.7 Could your guidelines or procedures be improved? If so please describe how.**

A theme identified by CEDR and some TIM agencies is continuous development of capability. This could be achieved through e.g technology, or establishing a dedicated Traffic Officer service, or by multi-agency agreements supported by common communications, common guidelines, regular round-table  ti-responder exercises, performance targets etc.

### **[Part 3 of 6] TIM PERFORMANCE AND ISSUES**

This section is to explore possible performance measures and their priority and to identify issues with measuring performance in practice and any plans for improvement.

**3.1 Please rank the importance of the following Performance Measures for assessing performance in dealing with incidents:\***

Please rank the following whether or not you actually measure them yourself. The next question will enable you to list any targets or thresholds you apply.

**PLEASE CHOOSE ONE IMPORTANCE VALUE FOR EACH PERFORMANCE MEASURE**

	Very important	Quite important	Quite unimportant	Not important at all	N/A or Don't Know
Incident detection time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Initial response time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emergency medical service response time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Very important	Quite important	Quite unimportant	Not important at all	N/A or Don't Know
Time to restore 'normal' flow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accuracy of location of incident	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality of reported description of incident	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to estimate duration of incident	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please describe under next question or select N/A)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 3.2 Please specify your targets or thresholds for TIM performance if appropriate.

These might include response times according to incident severity, clearance times. Please also use this space to describe and rank any significant Performance Measures not covered above.

### 3.3 What if any issues have you experienced in measuring TIM performance?\*

**PLEASE INDICATE ALL THAT APPLY**

- ☐ We do not use any performance measures
- ☐ We consider our performance measures adequate
- ☐ Incomplete recording of data
- ☐ No agreed method
- ☐ Method exists but difficult to apply
- ☐ Unclear what needs to be measured
- ☐ Ineffective communication or coordination with other bodies
- ☐ Conflicting interests or priorities (e.g. clearance v. investigation)
- ☐ Other:

### 3.4 Within your country or organisation, is there a separate high-level strategic plan or policy for developing or improving TIM capability? If so please describe and provide link if possible.

Please relate to Question 2.7 above if appropriate.

## [Part 4 of 6] INCIDENT DATA AND INFORMATION

Questions in this section relate to collection of data and dissemination of information to road users.

#### 4.1 What types of incident are logged by or on behalf of your organisation\*

**PLEASE INDICATE ALL THAT APPLY**

- ☐ We do not log incidents
- ☐ Minor or damage-only
- ☐ Slight injury
- ☐ Serious injury
- ☐ Death ('Fatality')
- ☐ Large Goods Vehicle involved
- ☐ Hazardous or biological materials involved
- ☐ Other:

#### 4.2 How are data recorded, by whom, and how can they be accessed?

For example, in the UK accident data are logged by Police on the STATS19 form. Research datasets are available from the UK's Economic and Social Data Service, and summaries are published by UK Government.

#### 4.3 What issues if any have you experienced with logging incidents?\*

**PLEASE INDICATE ALL THAT APPLY**

- ☐ The system is considered adequate and there are no issues
- ☐ Delay in obtaining the data collected
- ☐ Poor on-site investigation
- ☐ Lack of monitoring or recording equipment
- ☐ Other:

#### 4.4 What traveller information if any does your organisation provide?\*

**PLEASE INDICATE ALL THAT APPLY**. The next question will enable you to add a comment.

- ☐ We do not provide any traveller information
- ☐ Variable/Dynamic Message Signs
- ☐ Variable Mandatory Speed Limits
- ☐ Variable Advisory Speed Limits
- ☐ Via Traffic Management Centre
- ☐ Via open data (e.g. DATEX-2)
- ☐ TPEG (radio with automatic translation)
- ☐ Broadcast radio
- ☐ Webcast



Other:

**4.5 Please comment if appropriate on any issues you have found with information provision.**

These might include time delays, unpredictability of public response, policy to keep traffic queued on motorway rather than divert onto unsuitable network etc.

**[Part 5 of 6] INNOVATIVE TECHNOLOGIES FOR PROACTIVE TIM**

Proactive TIM is defined as two broad sets of techniques: MONITOR & ANTICIPATE changes in traffic state (level of service) and identify high-accident-risk locations, potentially using novel pre-incident management techniques and technologies. PREPARE & RESPOND, planning the most efficient response based on incident anticipation and known risks and costs of TIM techniques.

**5.1 What novel technologies or techniques do you use or would aid you in managing incidents?\***

A later question will enable you to comment freely on (other) novel technologies.

**PLEASE CHOOSE ONE STATUS VALUE FOR EACH TECHNIQUE**

	In use already	Plan to implement in the near future	Would help to improve TIM performance	No plans to use at this time	Don't Know or unaware of technique
Photogrammetry (e.g. laser scan)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quick clearance technique	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incident screens or other passive measures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Floating vehicle data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extended floating vehicle data (using many in-vehicle sensors)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cooperative Vehicle-Infrastructure Systems (CVIS)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
eCall	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drones	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please describe under Q5.3 later or enter N/A)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



**5.2 What constraints do you see affecting implementation of novel technologies?\*****PLEASE CHOOSE ONE IMPORTANCE VALUE FOR EACH ISSUE**

	Very Important	Quite important	Quite unimportant	Not important at all	Don't Know
Unknown benefits compared to costs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No budget available	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Difficulty integrating with existing TM systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incompatibility with existing infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please describe under Q5.3 below or enter N/A)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**5.3 Please comment if wished on novel technologies that would aid proactive TIM.**

**[Part 6 of 6] PERSONAL DETAILS AND CONTACT DATA**

We require these details so we can follow up the survey if necessary, and to enable us to keep you informed of progress in the project. Our use of these data is covered by our Data Protection and Information Security Policies compliant with the Data Protection Act and externally certified to ISO/IEC 27001.

**6.1 Name\***

**6.2 Organisation\***

**6.3 Region covered\***

**6.4 Contact email address\***

**6.5 Contact telephone number (with country code)\***

**6.6 Information about your organisation or link to web site**

Space for **GENERAL COMMENTS** about TIM or this survey