DG MOVE

Feasibility study on the

Vehicle Information Platform

Final Report

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Authors:

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Marie van de Poele
Alexia Bovy
Gina Marioni
Patrice-Emmanuel Schmitz
Rudolf De Schipper
Piotr Danowski
Wilfried De Wever
Gabriela Cojanu
Emidio Stani

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Abstract

The final report presents the results of the study on the feasibility of the creation of a European Vehicle Information Platform carried out by Unisys for the Directorate General Mobility and Transport of the European Commission. The purpose of the study was to evaluate the feasibility of the Vehicle Information Platform, establishing a seamless flow of information between all relevant actors involved in the area of roadworthiness testing, covering both periodic tests and roadside inspections. Besides facilitating data exchanges between Member States by linking existing national systems, this platform could also be used for collecting and storing the information related to odometer readings and main safety equipment of vehicles involved in serious accidents. After analysis of the business needs, business flows and their technical characteristics were identified. Taking into account re-usability of existing systems and cost effectiveness, four separate systems were proposed to cover all the needs of the VIP. Each system implements a specific type of information flow with respectively the EU institutions, the vehicle manufacturers and between Member States' actors. The cost analysis shows that this is the most economical way of proceeding. The implementation of the communication system between Member States requires the most workload.

Table of Contents

Table of Figures (figures numbering is based on the chapter they belong to)

Table of Tables (tables numbering is based on the chapter they belong to)

1 Executive summary

In July 2010, the European Commission adopted the policy orientations on road safety 2011-2020 with the target of halving the overall number of road fatalities in the EU between 2010 and 2020. In that scope, the Directorate General for Mobility and Transport (DG MOVE) led an impact assessment prior to the suggestion of a new legislation. With the objective of improving road safety, the new legislation called "roadworthiness package" lays down common requirements and harmonised rules concerning the roadworthiness tests throughout the Union.

With the objective to implement a communication flow between all stakeholders active in the roadworthiness testing, including national authorities as well as vehicle manufacturers, testing centres and test equipment providers, article 16 of the new directive on periodic roadworthiness tests requires the Commission to examine the feasibility of the implementation of an electronic Vehicle Information Platform (VIP).

The present study, launched by the European Commission, aims to evaluate the feasibility of the Vehicle Information Platform, establishing a seamless flow of information between actors and Member States involved in the area of roadworthiness testing, covering both periodic tests and roadside inspections. Besides facilitating data exchanges between Member States by linking existing national systems, the study is also expected to assess the possibility that this platform could be used for collecting and storing the information related to odometer readings and main safety equipment of vehicles involved in serious accidents.

The requirements of the VIP were first identified on the basis of the new legislation. They were complemented with the views of a range of experts at national and international level. The interviewees were invited to provide their reflections with an open, forward looking perspective. All data collected were consolidated into the current final report.

Based on the analysis of the business processes, data flows and their technical characteristics, three kinds of technical flows were identified. In order to maximise the re-use of existing systems and taking into account cost-effectiveness, it appears that instead of developing one over-arching system, separate systems could be used, each of them re-using an existing one. Each system implements one of the communication flows respectively with the EU institutions, with the vehicle manufacturers and between Member States.

The VIP for vehicle manufacturers (VIP-VM) covers all exchanges involving vehicle manufacturers, including vehicle technical data needed for periodic technical inspection (PTI) of vehicles as well as data needed for the test equipment manufacturers. Considering new test procedures taking into account electronic equipment of the vehicle, testing centres require access to additional data linked to the vehicle itself at the moment of the test. Considering the high frequency of the exchanges, the high number of users and stakeholders' network access, periodical technical inspection centres should connect to the vehicle manufacturers' website via an Internet connection in order to obtain the data they need to perform the tests on a specific vehicle. Connecting to the VIP-VM, PTI centres' users would be redirected to the relevant vehicle manufacturer's website. Test equipment manufacturers need electronic equipment technical data to set-up and maintain the test equipment. This kind of exchange may re-use the repair and maintenance systems that vehicle manufacturers are required to provide to workshops and garages. Test equipment manufacturers would only have the access to the information related to their needs. This system carries low development and maintenance costs (hereafter expressed as workload in person-months). The development and maintenance costs for the European Institutions are estimated to 12 person-months. Because each vehicle manufacturer has specific implementations and the requirements related to this data exchange are being defined at the time of writing, the costs for vehicle manufacturers and the Member States could not be estimated for this system.

The VIP for Member States (VIP-MS) covers international data exchanges between Member States' authorities, covering the registration, the periodical technical inspection (PTI) and roadside inspection (RSI) needs, under the condition that each Member State has a centralised system for registration, PTI and RSI data. International data exchanges linked to registration only concern vehicle re-registration in another Member State. Beside current data to be exchanged in that scope, vehicle historical data which includes accident history of the vehicle should also be transmitted. International data exchanges in the scope of PTI take into account future mutual recognition of PTI across the Member States. This future possibility requires increased harmonisation of testing rules and procedures between Member States. International data exchanges in the scope of RSI already take place as RSI are performed on foreign vehicles. Currently, these exchanges are not harmonised and manual procedures are in place. In this context, the VIP-MS would facilitate such exchanges, allowing better follow-up of defective vehicles.
Considering re-using current existing systems, it appears that the EUropean CAR and driving license Information System (EUCARIS) and the European Register of Road Transport Undertakings (ERRU) are the best candidates for the re-use. EUCARIS system owned by Member States having signed the EUCARIS Treaty, currently handles message exchanges between registration authorities, beside other kinds of data exchanges. From there, three options were assessed. The costs analysis and adequacy of each option to the requirements shows that the option of re-using EUCARIS for the VIP-MS is very attractive but faces a major issue: because the European Commission does not own this system, a strong governance process is required.
Implementing VIP-MS on ERRU only is best suited for the VIP-MS. This second option requires ten (10) Member States to update their connectivity linked to the current use of ERRU, increasing the total development and maintenance costs, making this option the most expensive.
If requested by Member States, the third option considers that the current connectivity between ERRU and EUCARIS is maintained. This option brings the total development and implementation costs to the level of the second option.
An additional fourth option was considered: the implementation of a new system similar to ERRU, re-using the current framework and development techniques in place at the European Commission. Although this option requires all Member States to create an additional connection to the EC platform, the current assessment shows that this solution provides the same advantages as the second option (re-using ERRU only) at lower costs.
Depending on the impact of each option on the connectivity to VIP-MS, the maintenance and implementation costs for each Member State vary between 51 and 69 person-months. The costs for the European Institutions depend on the selected option, varying between 54 and 124 person-months.
The VIP for EU institutions (VIP-EU) covers the exchange of national RSI reports and statistics. Because of the low frequency of these exchanges, re-using existing systems is the most cost-effective option. Reports and statistics concerning roadside inspection activities can be exchanged via the Communication and Information Resource Centre Administrations, Businesses and Citizens (CIRCABC) with a standardised data format and structure. CIRCABC is an e-government solution supporting the online collaborative activities of the European Union's public administrations. The other option considers extending the VIP-MS part of the system. Although this option it is the more expensive than the re-use of CIRCABC, it has the important advantage of providing automated follow-up, data validation and data consolidation functionalities. Therefore, it is preferred. In that scope, the implementation of that option may easily be taken into account in the implementation plan of the VIP-MS.
Implementation costs for Member States in the scope of VIP-EU are estimated to 3 person-months. The costs for the European institutions to implement VIP-EU vary from 3 to 6 person-months, depending on the option chosen.

Considering In total, depending on the option chosen for the VIP-MS and VIP-EU systems, the overall workload effort for the development and the maintenance of the complete VIP, including the three systems implemented into 28 Member States, varies between 1,590 and 1,770 person-months.
Independently of the vehicle information data flow, the study shows that a common data format and structure is a pre-requisite for the implementation of the VIP. This will benefit all stakeholders by facilitating data exchanges and increasing data quality at all levels of the vehicle life cycle. The study provides set of guidelines and points to best practices which are recommended to be applied during the development of such standard.
At an organisational level, the study analyses the impact on the national data flows in terms of functionalities, roles and responsibilities. Because each Member States has its own organisation, the study provides an organisational model as a guideline only.
However, in the scope of consumer protection, the study shows that a gradual implementation of vehicle history information is recommended, starting with the odometer readings. That functionality may be extended at a later stage with accident information.
From a legal point of view, common rules for data usage should be clarified, taking into account personal data protection as well as data ownership rights. A common EU governance framework for the VIP should be created and adhered to by all Member States.

As a conclusion, the implementation of a Vehicle Information Platform is feasible by extending existing systems, but under certain conditions. If the case such conditions cannot be met, implementing a new system is possible but at additional costs and time. A pre-requisite for any option selected is the definition of common rules and data formats. The further implementation of the identified sub-systems may follow separate and independent timelines. The study suggests a staged approach based on the current readiness of the Member States to the implementation of the international data exchanges.

2 Introduction

In July 2010, The European Commission adopted the policy orientations on road safety 2011-2020[1] with the target of halving the overall number of road deaths in the EU between 2010 and 2020. In that scope, the Directorate General for Mobility and Transport (DG MOVE) led an Impact assessment prior to the suggestion of a new legislation for the roadworthiness package[2]. The study trigger was the presence on the roads of a high number of vehicles with technical defects causing accidents, injuries and fatalities. The study provided evidence on the link between road safety improvement and higher roadworthiness requirements.

The 2010 study also identified two root causes of the high level of technical defects:

- The scope of the current EU legislation related to roadworthiness is too narrow and the level of requirements it sets is too low.
- The concerned actors don't exchange information and vital data for effective tests and test results enforcement.

In order to increase road safety, the EU decided to update the current roadworthiness legislation in order to take the vehicle's technological evolution into account and to facilitate a seamless flow of information between actors and Member States involved in the roadworthiness testing.

The new regulation hereafter called "New roadworthiness package" consists of three directives regarding respectively periodic technical inspection[3], roadside inspection[4] and vehicle registration documents[5]. The objective of this new regulation is "to improve road safety by laying down minimum common requirements and harmonised rules concerning roadworthiness tests of vehicles throughout the Union"[3].
The new regulation defines how each Member State competent authority shall communicate electronically the documents related to roadworthiness (RW) - Periodical Technical Inspection (PTI) and Roadside Inspection (RSI) - and re-registration of vehicles.

Another important aspect of this new legislation foresees that vehicle manufacturers shall provide PTI centres or national authorities with the necessary vehicle technical information for roadworthiness testing. The new regulation on PTI tests specifies recommended methods for testing the functionality of safety and environment related components through the use of the electronic vehicle interface. In order to perform these tests, PTI centres will need specific technical information linked to each individual vehicle. That information is owned by vehicle manufacturers and is not part of the official documents they are to deliver. That's why access to this information at the time of technical inspection is crucial.

[1] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Towards a European road safety area: policy orientations on road safety 2011-2020, COM(2010) 389 final.
[2] Staff Working Paper Impact Assessment accompanying document to the Regulation of the European Parliament and of the Council on Periodic Roadworthiness Tests for Motor Vehicles and their Trailers and repealing Directive 2009/40/EC and Regulation of the European Parliament and of the Council on the Technical Roadside Inspections of the Roadworthiness of Commercial Vehicles Circulating in the Union and repealing Directive 2000/30/EC and Directive of the European Parliament and of the Council amending Council Directive 1 999/37/EC on the Registration Documents for Vehicles {COM(2012) 380 final} {SWD(2012) 207 final}, of Brussels, 13.7.2012 {SWD(2012) 206 final}
[3] Directive 2014/45/EU of the European Parliament and of the Council of 3 April 2014 on periodic roadworthiness tests for motor vehicles and their trailers and repealing Directive 2009/40/EC, L 127/51 of 29.04.2014
[4] Directive 2014/47/EU of the European Parliament and of the Council of 3 April 2014 on the technical roadside inspection of the roadworthiness of commercial vehicles circulating in the Union and repealing Directive 2000/30/EC, L 127/134 of 29.04.2014
[5] Directive 2014/46/EU of the European Parliament and of the Council of 3 April 2014 amending Council Directive 1999/37/EC on the registration documents for vehicles, L 127/129 of 29.04.2014

Article 16 of the new directive on periodic roadworthiness tests[3] above requires the Commission to examine the feasibility, costs and benefits of the implementation of an electronic Vehicle Information Platform (VIP).
The objective of this platform is to "link the existing national systems with a view to facilitating exchanges of information on data relating to roadworthiness testing and odometer readings between the competent authorities of Member States responsible for testing, registration and vehicle approval, testing centres, test equipment manufacturers and vehicle manufacturers"[6].

On top of this, the vehicle information platform could be used for collecting and storing information related to the main safety equipment of vehicles involved in serious accidents as well as accident history and odometer readings.

2.1 Study objectives

The current study aims to look into the feasibility of establishing a seamless flow of information between actors and Member States involved in the area of roadworthiness testing, covering both periodic tests and roadside inspections.
Based on the analysis and assessment of the current situation of roadworthiness in the Member States, this study aims at identifying the most appropriate architecture and data information exchange platform answering the following key questions:

- What are the roles and the responsibilities of stakeholders in terms of functional processes and data ownership?
- What are the legal constraints?
- What data has to be exchanged, under what format and standards?
- What are the possible technical options for interconnecting identified registers?
- What are the costs and the benefits?
- What are the recommendations?

2.2 Methodology

The methodology used to conduct the feasibility study on the VIP included four different steps:

- **Desktop research** which included the review of the current EU legal framework[7], as well as relevant studies and other documentation in the field. The proposal for the Roadworthiness Package which was under the legislative process at the European Parliament and the Council was also taken into account.

- **Use of questionnaires**[8] that were disseminated via e-mail to the relevant authorities of each Member State that agreed to be part of this study with the support of a national Single Point of Contact in order to collect relevant information. In total, 46 questionnaires were sent (two per Member State – one questionnaire covering the country overview and another one specific to registers). Questionnaires were also sent

[6] Idem, article 16
[7] See 8.2The current legal framework
[8] See 8.6.1 Questionnaires

to international stakeholders (vehicles manufacturers' international association and testing equipment providers' international association).

- **Visits and interviews** aimed at collecting views from subject matter experts and validating answers provided in the questionnaires. Interviews have been organised under the form of on-line meetings or at the premises of the participating Member States and other relevant stakeholders (i.e. EReg, ACEA and EGEA). The answers to the questionnaires were the basis to complete the interviews guide[9] used during the meetings to clarify questionnaire findings and discuss the possible implementation of a Vehicle Information Platform. After the meeting, a report has been sent to all participants for validation. The list of contact names may be found in annex 8.7 Contact list.

- **Consolidation and analysis**, which represented the business, legal and technical analysis of the information collected in the course of the study, included answers to the study questionnaire, feedback received during the visits to Member States and discussions with international stakeholders.

2.3 Contextual issues

In the course of the study, several difficulties were encountered which are briefly summarised below:

- Due to the difficulties in defining the responsible competent authority, the nomination of a SPOC for the purpose of the present study was delayed in several cases. Such situation required additional efforts of the study team to ensure the continuity of the communication on the subject matter.
- Because of the large scope and high level requirements described in the new regulation, the communication with stakeholders was very useful. This brought in useful information and points of views, that didn't all go in the same direction because of different interests. A focused scope helped in identifying the real needs regarding the VIP.
- According to the approved methodology, the study was primarily targeted to collecting the Member States' opinion and the feedback of experts representing their national administration. This is the right way for assessing the evolution rate of opinions inside the "Member States community" but is not likely to produce "clear cut" or really innovative propositions.
- A number of Member States' experts were not able to provide quantitative responses on the existing systems (like performance, SLA and budget information).
- Flexibility was required from the study team to adapt the methodology to the evolving mission objectives throughout the course of the study within the boundaries of the contract.

[9] See 8.6.2 Interview Guide

3 Overview of the current situation

3.1 The vehicle life cycle

The vehicle life cycle starts with the production of the vehicle by the manufacturer. Any vehicle put into service in the EU has to meet the requirements and standards defined and approved as per the EU Type Approval requirements. The Type Approval process is a complex and multiple step process during which all parts of the vehicle as well as the complete vehicle are tested and approved. Each Type Approval receives an EC type-approval number and is valid in any Member State of the EU. On top of this, single vehicle approval occurs at national level when important changes occur on the vehicle or during individual import of vehicles from 3rd countries.
When producing a vehicle, the vehicle manufacturer provides a Certificate of Conformity (CoC), certifying that the vehicle meets all relevant standards related to the type approval for this type of vehicle.

In order for the vehicle to have the permission to circulate on public roads, a vehicle has to be registered by the national registration authority. During this first registration process, several verifications occur like checks against information provided in the CoC, validity of the certificate of conformity, insurances, taxes, etc… At the end of the registration process, the vehicle registration certificate is issued to the registration holder.

During its life cycle, several events may occur to the vehicle. The ones identified in the scope of the Vehicle Information Platform are the following:

- Periodic technical inspections;
- Roadside inspection;
- Accident;
- Change of ownership;
- Modifications applied to the vehicle;
- Repair and maintenance.

The objective of Periodic Technical Inspections (PTI) of vehicles is to ensure the safety and environmental conditions of the vehicle throughout its life-cycle. The frequency and type of periodical tests are defined in the legislation and mainly depend on the age, the category and the kind of usage of the vehicle. In some Member States, additional technical inspection may be requested after a vehicle has been repaired due to accidents or when vehicle ownership changes.
After each technical inspection, a roadworthiness (RW) certificate is issued, indicating the result of the inspection and the date of the next test. If serious defects have been identified that prevent the vehicle to circulate, a new inspection is required after repair of the defects.
Currently, technical inspectors mainly perform visual inspections on the vehicles with the exception of brakes and emissions where measurements are required. Visual checks are done in different operating conditions i.e. visual checks of components when a system is operated.
With the increasing implementation of electronic components in vehicles, visual checks become insufficient to ensure vehicle safety and environmental compliance. That's why one of the objectives of the new RW package[3,4,5] is to take into account the constant evolution of those electronic components by defining tests and procedures to verify the correct functionality of those components.

Roadside Inspections (RSI) only concern commercial vehicles and are performed along highways and main roads. Beside a technical inspection of the vehicle, roadside inspection also covers checks related

to transport like driving and resting time of the driver, transport of dangerous goods, cargo securing, etc. The main objective of roadside inspection is to ensure that all commercial vehicles driving on the national territory meet the roadworthiness requirements. That's why both national and foreign vehicles are subject to roadside inspection. Roadside inspection is also considered to complement periodical technical inspections.
The result of each roadside inspection is reported by the inspector on the roadside inspection report that is issued. In case major or dangerous deficiencies are identified, the report is sent to the competent national authority from the MS of registration.

Vehicle ownership change is recorded through the re-registration process. This process can occur in the same Member State of previous registration, or in another one. Beside checks on taxes and insurances, the re-registration authority will perform verifications based on the last registration certificate. In some Member States, the last roadworthiness certificate is verified as well. When all verifications are complete, the re-registration authority issues a new registration certificate. The previous registration authority is then informed that the previous registration certificate is withdrawn.

Vehicles can be involved in accidents. Depending on the accident severity level, the vehicle may be repaired or not. Some Member States require that repaired vehicles involved in serious accidents have to undergo technical inspection before being allowed to circulate again.

During their life cycle, vehicle may undergo modifications. In some Member States, such changes are identified in the legislation and need to be recorded by the registration authorities.

As part of repair and maintenance operations, the on-board diagnostics systems are verified and may be updated with the latest version of the software, without altering their original functionalities.

At vehicle's end-of-life and when all measures have been taken to treat the vehicle accordingly, a certificate of destruction is provided to the registration authority. The vehicle is then registered as end-of-life and registration is cancelled permanently.

The following picture summarises the vehicle life cycle:

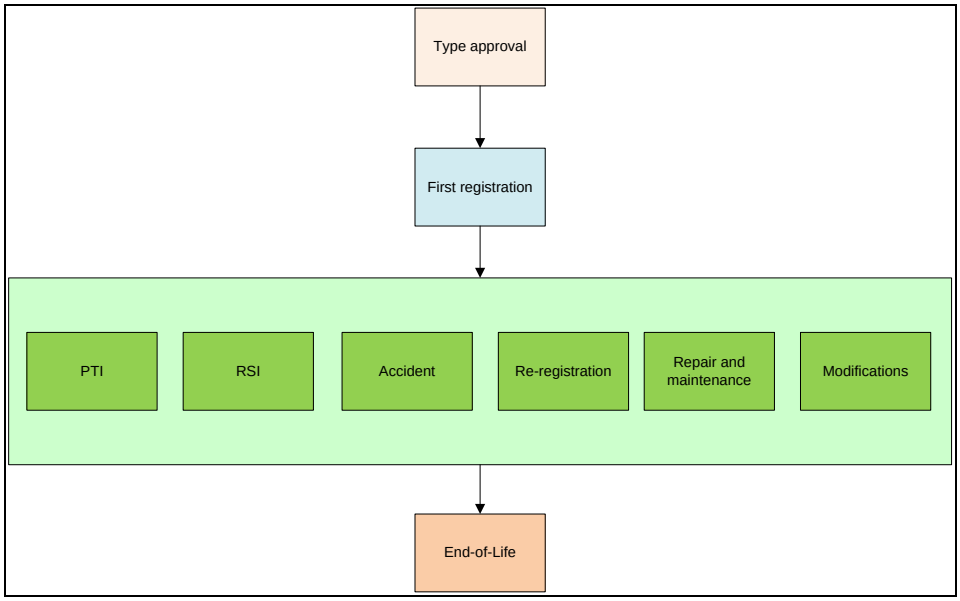

Figure 3-1: Vehicle life cycle

The Vehicle Information Platform concerns the implementation of international data exchanges that occur in the scope of periodical technical inspection (PTI), roadside inspection (RSI), re-registration and accidents.

3.2 The European Union wide environment

This section describes the current roadworthiness environment at EU level, covering the legal framework and current information and communication technology (ICT) systems related to the vehicle life cycle data management.

3.2.1 EU legislation

Existing EU rules on roadworthiness testing date from 1977[10], they set minimum standards for vehicle checks and have only been marginally updated since.

The new roadworthiness package**,** adopted by the European Parliament and the Council on 03/04/2014, has further updated vehicle legislation at EU level in the scope of registration, PTI and RSI. The three Directives that constitute the roadworthiness package are:

- The Directive 2014/45/EU on periodic roadworthiness tests for motor vehicles and their trailers, repealing the Council Directive 2009/40/EC [3];
- The Directive 2014/46/EU amending the Council Directive 1999/37/EC on the registration documents for vehicles [5];
- The Directive 2014/47/EU on the technical roadside inspection of the roadworthiness of commercial vehicles circulating in the Union, repealing the Council Directive 2000/30/EC[4.]

[10] Council Directive 77/143/EEC of 29 December 1976 on the approximation of the laws of the Member States relating to roadworthiness tests for motor vehicles and their trailers, OJ L 47 of 18.02.1977

This new legislative package aims to improve the road safety, reduce the emissions in road transport and ensure the fair competition for commercial vehicles via more harmonised rules. Member States can now exchange vehicle-related information stored in national registers via new those legal provisions. A summary of changes introduced by the roadworthiness package can be found in the press release made by the Council on 24th of March 2014[11].

A list of the current EU legislation related to type approval, vehicle registration, PTI, RSI and vehicle end-of-life in place before the adoption of the new RW package can be found in annex 8.2.1 'EU legislation related to the vehicle life cycle'.

The root legal basis of the Vehicle Information Platform is Article 91 of the Treaty on the Functioning of the European Union[12]. After all, its main and predominant aim is to improve road safety. The Vehicle Information Platform is not directly linked to the objectives of police cooperation. Article 67, 3 of the Treaty on the Functioning of the European Union, mentioning the common EU aim to ensure a high level of security on the basis of coordination and cooperation between police, judicial and other competent authorities could only be regarded as a (complementary) legal basis, for those cases where the security of EU citizens is endangered by mismanagement of vehicle information and, more in particular in the domains of prevention of crime or external border control[13]. For the VIP use cases described in this report, improving road safety is the primary objective.

Besides the legal basis available at EU level, MS naturally can take other initiatives on a bi-lateral or multi-lateral level based on their national sovereignty[14].

3.2.2 The existing systems

Currently, several systems are in place at EU level in order for stakeholders to exchange or transmit information in the scope of vehicle information for the following domains:

- Tachograph;
- Driving licences;
- Road transport undertakings;
- Registration;
- Accidents.
- Vehicle repair and maintenance information

These systems are managed either by the EU, the Member States or private stakeholders.

[11] Council of the European Union press release, Council adopts the roadworthiness package, 7979/14 (OR. en), PRESSE 169, of Brussels 24.03.2014
[12] Treaty Establishing The European Community (2002), *consolidated version, C 325/35 of 24.12.2002*
[13] Argumentation in analogy with the Decision of the Court of Justice of the European Union of 6 May 2014 (Case C-43/12) the Court annulled the directive on cross-border exchange of information on road safety related traffic offences because it was founded on the legal basis of police cooperation, whereas the main and predominant aim of the legislation is improving Road Safety.
14 The Prüm Treaty, one of the legal bases for the vehicle information exchange via Eucaris originated as a multi-lateral country initiative.

3.2.2.1 Systems managed by the EU

3.2.2.1.1 TACHOnet

Description

TACHOnet (Telematics Network for the Exchange of Information Concerning the Issuing of Tachograph Cards) is a system to exchange structured messages between different countries on truck and coach drivers when checking tachograph cards. The Commission Regulation (EU) No 1266/2009[15] requires Member States to exchange information electronically in order to ensure that the tachographs are properly used to control the application of the social road transport rules.

Each MS collects al driver's card data into a single system called Card Issuing Authority (CIA) which is connected to the TACHOnet messaging system. Road enforcements authorities have access to the TACHOnet system in order to enquire on the card details which include personal data concerning the driver.

TACHOnet system allows data exchange for the following administrative tasks related to tachograph cards:

- Issuing of cards;
- Lost/stolen card declaration;
- Malfunctioning card declaration;
- Renewal of a card;
- Exchange of a card;
- Replacement of the card;
- Checking tachograph card status;
- Checking driver's issued card;

The system has been in production for several years. Up to 30 million valid messages were exchanged in 2011. The use of the system is mandatory for each MS as from March 2016.
The system is owned and maintained by EC.

Legal framework:

- Council Regulation (EEC) No 3821/85[16];
- Commission Regulation (EU) No 1266/2009[15];
- Regulation (EU) No 165/2014 of the European Parliament and of the Council[17].

[15] Commission Regulation (EU) No 1266/2009 of 16 December 2009 adapting for the tenth time to technical progress Council Regulation (EEC) No 3821/85 on recording equipment in road transport, OJ L 339/3 of 22.12.2009
[16] Council Regulation (EEC) No 3821/85 of 20 December 1985 on recording equipment in road transport, OJ L 370 of 31.12.1985
[17] Regulation (EU) No 165/2014 of the European Parliament and of the Council of 4 February 2014 on tachographs in road transport, repealing Council Regulation (EEC) No 3821/85 on recording equipment in road transport and amending Regulation (EC) No 561/2006 of the European Parliament and of the Council on the harmonisation of certain social legislation relating to road transport, OJ L 60/1 of 28.02.2014

Technology and architecture

The request and response messages are XML messages sent in an asynchronous mode through the sTESTA network using HTTPS protocol and digital certificates. TACHOnet system is responsible for:

- Authentication and validation of messages;
- Data transformation - since requests can be sent to multiple MS, the TACHOnet system is responsible for consolidating responses from all MS;
- System usage logging.

The system ensures security through encryption of data transferred.
The architecture of the TACHOnet consists of the TACHOnet messaging system acting as secure and reliable "hub & spokes" system for sending XML requests to and receiving XML responses from the different Member States and corresponding Card Issuing Authorities.

The technology underneath is Microsoft BizTalk with Microsoft SQL Server running on Microsoft Windows environment with Microsoft IIS.

TACHOnet is implemented on a hardware and COTS platform owned by DG MOVE. This platform, named MOVEHUB is shared by 2 other systems owned by the DG MOVE, namely RESPER and ERRU, described hereafter.

For more information about the TACHOnet system see TACHOnet - Global Business Analysis[18], TACHOnet - Software Requirements Specification[19] and TACHOnet - XML Messaging Reference[20].

3.2.2.1.2 RESPER

Description
The RESPER (RESeau PERmis de conduire - Driving License Network project) network has been conceived to ensure that the requirements of the 3rd Driving Licence Directive[21] (2006/126/EC) are met by the Member States. It establishes an interoperable, XML-based, data exchange network between driving licence administrations in national authorities of the Member States as required by the Legislative Framework.

The legal context of the RESPER system is enforced by the Directive 2006/126/EC[21] to guarantee mutual recognition of documents and acquired rights originating in other Member States, combat document fraud and avoid the issuance of multiple licences.

Drivers are in possession of a driving license issued by their country of residence. Member States can exchange information about driving licences through the RESPER system.

Each MS has a single access point to the RESPER system by which it can perform the following tasks:

- Search for a driving license;
- Get driving license details;

[18] European Commission Directorate General for Energy & Transport, DG TREN, TACHOnet, Global Business Analysis, version v01_30 of 30.01.2006
[19] European Commission Directorate General for Energy & Transport, DG TREN, TACHOnet, Software Requirements Specification, version v01_00 of 21.02.2003
[20] European Commission Directorate General for Energy & Transport, TACHOnet Project, XML Messaging Reference Guide, version v 1.5 of 17.01.2011
[21] Directive 2006/126/EC of the European Parliament and of the Council of 20 December 2006 on driving licences, OJ L 403 of 30.12.2006

- Notify the change of status of driving license to other Member State;
- Exchange secure messages for follow up.

The use of the system is mandatory for each Member State since January 2013.
The system is owned and maintained by EC.

Technology and architecture

The RESPER architecture and technology used are the same as for TACHOnet

For more information about the RESPER system, see the Global Business Analysis[22] document, the Network Security and Reference Guide[23] and the XML Messaging Reference Guide[24].

3.2.2.1.3 ERRU

Description

The ERRU (European Register for Road transport Undertaking) system is the interconnection of national electronic registers on road transport undertakings as foreseen in Regulation (EC) No 1071/2009[25]. Minimum requirements on the national registers have been laid down in Commission Decision 2009/992/EU[26]. The rules on the interconnection are specified in Commission Regulation (EU) No 1213/2010[27] adopted on 16 December 2010.

Full legal context of ERRU is enforced by following legal acts:

- Commission Decision 2009/992/EU[28];
- Regulation (EC) No 1071/2009[25],;
- Regulation (EC) No 1072/2009[29];
- Regulation (EC) No 1073/2009[30];
- Commission Regulation (EU) No 1213/2010[27];

These regulations modernises, simplifies and streamlines rules in the road haulage transport sector in order to improve the efficiency of the EU by harmonising rules on access to the road haulage profession, access to the international haulage market, definition of national registers of road transport undertakings and their interconnection.

[22] European Commission and Atos, European Commission Directorate General for Energy & Transport, RESPER, Global Business Analysis, version v 1.02 of 19.10.2011
[23] European Commission and Atos, European Commission Directorate General for Mobility & Transport, RESPER, Network and Security Reference Guide, v 1.00 of 10.10.2011
[24] European Commission and Atos, European Commission Directorate General for Mobility & Transport, RESPER, XML Messaging Reference Guide, v 2.30 of 24.07.2012
[25] Regulation (EC) No 1071/2009 of the European Parliament and of the Council of 21 October 2009 establishing common rules concerning the conditions to be complied with to pursue the occupation of road transport operator and repealing Council Directive 96/26/EC, OJ L 300/51 of 14.11.2009
[26] Commission Decision of 17 December 2009 on minimum requirements for the data to be entered in the national electronic register of road transport undertakings (notified under document C(2009) 9959), OJ L 339/36 of 22.12.2009
[27] Commission Regulation (EU) No 1213/2010 of 16 December 2010 establishing common rules concerning the interconnection of national electronic registers on road transport undertakings, OJ L 335/21 of 18.12.2010
[28] Commission Decision of 17 December 2009 on minimum requirements for the data to be entered in the national electronic register of road transport undertakings (notified under document C(2009) 9959), OJ L 339/36 of 22.12.2009
[29] Regulation (EC) No 1072/2009 of the European Parliament and of the Council of 21 October 2009 on common rules for access to the international road haulage market, OJ L 300/72 of 14.11.2009
[30] Regulation (EC) No 1073/2009 of the European Parliament and of the Council of 21 October 2009 on common rules for access to the international market for coach and bus services, and amending Regulation (EC) No 561/2006, OJ L 300/88 of 14.11.2009

Each MS can have multiple Competent Authorities which can award, suspend or withdraw authorisations to pursue the occupation of road transport operator but there is single access point per MS which has access to the ERRU system.
Each MS can perform, through the ERRU system, the following tasks:

- Infringement Notification;
- Check good repute of transport manager.

The use of the system is mandatory for each MS since January 2013. The system is owned and maintained by EC.

Technology and architecture

The ERRU architecture and technology used are the same as for TACHOnet.
For more information about the ERRU systems see

- European Register for Road Transport Undertakings, Global Business Analysis[31];
- Network and Security Reference Guide[32];
- XML Messaging Reference Guide[33].

3.2.2.1.4 CIRCABC

Description

CIRCABC (Communication and Information Resource Centre for Administrations, Businesses and Citizens) is system which enables geographically spread collaborative groups to share information and resources in private workspaces. It offers:

- Distribution and management of documents and files in any format, any language and with version control.
- Easy document and user management through interactive forms.
- Advanced access control.
- Sharing of workspaces.
- Newsgroups and events scheduling.
- Follow-up of meetings.

The system is owned and maintained by EC.

Technology and architecture

CIRCABC is an open-source web-based application.

[31] European Commission Directorate General For Mobility & Transport European (Register for Road Transport - Undertakings) and Siemens, European Register for Road Transport Undertakings, Global Business Analysis, v 2.0 of 23.09.2011
[32] European Commission Directorate General For Mobility & Transport European (Register for Road Transport - Undertakings) and Siemens, Network and Security Reference Guide, version v 1.10 of 23.08.2011
[33] European Commission Directorate General for Mobility & Transport (European Register for Road Transport – Undertakings) and Atos, XML Messaging Reference Guide, version v3.00 of 14.03.2012

3.2.2.1.5 CARE

Description

CARE (Community database on Accidents on the Roads in Europe) is a Community database on road accidents resulting in death or injury.

CARE contains anonymised data on individual accidents as collected by the Member States. It is populated with the data provided by MS on yearly basis. This structure allows for maximum flexibility and potential regarding the analysis of the information contained in the system and opens up a whole set of new possibilities in the field of accident analysis.

The purpose of the CARE system is to provide a powerful tool which would make it possible to identify and quantify road safety problems throughout the European roads, evaluate the efficiency of road safety measures, determine the relevance of Community actions and facilitate the exchange of experience in this field.

Its legal base is the "Council decision on 30 November 1993 the creation of a Community database on road accidents" (Council Decision 93/704/EC[34]).

The system is owned and maintained by EC.

Technology and architecture

It uses number of technologies:

- For data collection: eDAMIS (The electronic Data files Administration and Management Information System) – EU integrated environment for data transmission and for the single entry point for data arriving at Eurostat.
- For data loading, processing and transformation: SAP BusinessObjects Data Services.
- For data warehouse: Oracle.
- For data presentation: SAP BusinessObjects XI and ArcGIS.

[34] Council Decision of 30 November 1993 on the creation of a Community database on road accidents (93/704/EC), OJ No L 329/63 0f 30.12.1993

3.2.2.2 Other systems

3.2.2.2.1 European CAR and driving license Information System (EUCARIS)

Description

The EUCARIS (European CAR and driving license Information System) system has been implemented by MS in the scope of a multilateral treaty (initially between BE, NL and LU), providing participating countries the opportunity to share car and driving licence registration information in order to help fighting car theft and registration fraud.
EUCARIS is an information exchange system that provides an infrastructure and software to countries to share, among others, their vehicle and driving license registration information in the scope of the following legal frameworks:

- Vehicle information (EUCARIS Treaty);
- Driving license information (EUCARIS Treaty);
- Police information (Prüm Treaty);
- Cross-Border Exchange of information on road safety related traffic offences (CBE Directive 2011/82/EU[35]).

The architecture allows various message flows implemented under those legal frameworks to be completely independent from each other.

Within a Member State, EUCARIS can deal with different national organisations, each having its own EUCARIS interface. This is currently the case in France and Luxembourg having each two connection points dealing with different services. Finland also has 2 connection points in order to separate the outgoing requests (user organization) from the incoming requests (data provision).

The ownership of EUCARIS belongs to MS having signed the EUCARIS Treaty or having acceded to it[36] – some MS do not participate. All strategic management decisions are taken by the EUCARIS Participants' Board representing all the members. The Participants' Board appoints one Member State as the secretary state. This state is assigned the operational system management of EUCARIS, including monitoring, service desk support, development and deployment of new releases as well as reporting on the system availability.

Technology and architecture

EUCARIS is a peer to peer system with distributed architecture, providing countries a generic platform to share all kinds of transport related data. EUCARIS is also connected to ERRU and RESPER hubs. Individual Member States may choose to connect to ERRU and RESPER hub via EUCARIS.

The EUCARIS application has been written in the Microsoft C# development language and operates on a Windows environment using Microsoft .NET Framework and Microsoft IIS. All data regarding logging, configuration and customization information is stored in the database (Microsoft SQL or Oracle can be used). The response and request messages are encrypted XML messages.

[35] Directive 2011/82/EU of the European Parliament and of the Council of 25 October 2011 facilitating the cross-border exchange of information on road safety related traffic offences, OJ L 288/1 of 5.11.2011
[36] EUCARIS Rules of Procedure, 1 October 2010

3.2.2.2.2 Repair and maintenance information websites

Description

Currently the only European legislation defining standards for Repair and Maintenance Information is the legislation on emission standards (Commission Regulation (EC) No 692/2008 of 18 July 2008[37]). These standards ensure common requirements for motor vehicle emissions, replacement parts and access to vehicle Repair and Maintenance Information (RMI) to be provided by vehicle manufacturers. Authorised dealers, repairers, or independent operators can access this information via vehicle manufacturer's websites.

Technology and architecture

Vehicle manufacturers are free to select the technology to be used for their RMI websites. Current legislation only lays down technical requirements for the accessibility to the vehicle repair and maintenance information.
The OASIS standard format is applicable only in the scope of emission-related repair, diagnostic and technical information with respect to the passenger cars and light commercial vehicles. During the interviews conducted in the scope of this study, it was found that in practice, the OASIS format is not implemented.
Therefore, through Regulation (EC) 715/2007, the EC grants mandate[38] to the European Committee for Standardization (CEN) to develop standards for the terminology[39] and access[40] to road vehicles repair and maintenance information websites that are provided by vehicle manufacturers. These standards affect manufacturers of light and commercial vehicles type-approved as EURO 5/6 and heavy duty vehicles type-approved as EURO VI. At the time of writing, this standard is still under development.

[37] COMMISSION REGULATION (EC) No 692/2008 of 18 July 2008 implementing and amending Regulation (EC) No 715/2007 of the European Parliament and of the Council on type-approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information
[38] EC mandate M/421 from 21 January 2008: Mandate to the European Standardisation Organisations for Standardisation in the field of vehicle OBD, repair and maintenance information
[39] EN ISO 18542 "Standardized repair and maintenance information (RMI) Terminology"
[40] EN ISO 18541 "Standardized access to automotive repair and maintenance information (RMI)"

3.3 Overview of the current situation in the Member States

This section provides an overview of the current situation of the registration, PTI and RSI processes in the Member States, with a focus on the national organisation of the authorities and stakeholders together with the practical organisation of data storage. A detailed profile per Member State can be found in annex 8.9 'MS profiles'.

The information gathered provides from the Member States through the completed questionnaires and interviews performed. Nineteen (19) Member States participated actively to the study: AT, BE, DE, EE, ES, FI, FR, HR, HU, IE, IT, LT, LU, LV, NL, PL, RO, SE and UK. Please note that all figures and percentages presented in this section refer to this list of Member States.

The following table gives an overview of participation of MS. Within the participating Member States, 2 Member States provided the study team with late responses and additional questions were provided via mail or phone when possible.

Denied to participate	1 MS
SPOC identified	22 MS
Responses to both questionnaires	19 MS
Visits performed	11 MS
On-line meetings	8 MS

Table 3-1: Participation of MS: overview.

For each kind of information discussed in this section, detailed values per MS can be found in annex 8.9 'MS profiles'.

3.3.1 Registration

Registration authorities are responsible for the registration of any vehicle subject to registration under their national legislation. They issue the registration certificate. Among the data needed to issue the registration certificate, Member States need the Certificate of Conformity (CoC) delivered by vehicle manufacturers at first registration. Vehicle manufacturers have the obligation to provide a paper version of the CoC. One third (37%) of the participating Member States require an electronic transmission of the CoC data from vehicle manufacturers. CoC data is stored in a national register in 74% of the participating Member States. Among them, two (2) Member States plan to implement this functionality in the future (end 2014 and 2016).

All participating Member States have all registration data stored in a centralised national register. The following table shows, per vehicle category, the percentage of participating Member States storing registration information in their registration register:

Vehicle category	% of MS storing registration data in registration register
M Motor vehicles with at least four wheels designed and constructed for the carriage of passengers	100 %
N Motor vehicles with at least four wheels designed and constructed for the carriage of goods	100 %
O Trailers (including semi-trailers)	100 %
L Mopeds, motorcycles, tricycles and quadricycles	95 %
T Agricultural and forestry tractors	74 %

Table 3-2: % of MS storing vehicle categories registration in their registration register

For some MS, registration data of vehicle categories L and T may be stored in another register than the register owned by the Registration authority.

3.3.2 Periodical Technical Inspection (PTI)

The PTI authority is responsible for PTI EU and national law enforcement. EU legislation describes a minimum frequency and set of test items and test procedures to be performed. Member States may extend the scope of the tests as well as the frequency of periodic inspections.

In the participating Member States, PTI is performed by different kinds of bodies, but they all need to be entrusted or supervised by the national PTI authority. Public PTI centres generally depend directly from the PTI authority. Private PTI centres may be dedicated PTI centres or workshops and garages.

Public PTI centres report to the PTI authority. Private PTI authorised bodies also report to the PTI authority, directly or through a national or local representative body.

A roadworthiness (RW) certificate is issued after each inspection, reflecting the test outcome. This certificate contains core elements among which are the next inspection date and odometer reading (if available). RW certificates and test results are recorded by PTI centres. RW certificates information is made available or sent to the PTI authority by PTI testing centres. All participating MS store the RW certificate in a database. This database is centralised for all participating Member States, except one (1).

With the exception of one (1) of the participating Member States, no systematic information exchange occurs between PTI centres and vehicle manufacturers. In those Member States, such information is provided on request.

PTI is performed in the vehicle's registration Member State. Only NL has bilateral agreements with ES and BE for PTI to be performed on Dutch vehicles in those Member States. In that case, PTI is performed according to the Dutch rules. RW certificates and test reports are sent directly to the Dutch PTI authority.

3.3.3 Roadside inspection (RSI)

The RSI authority is responsible for RSI law enforcement. The result of this inspection is reported onto the RSI report. The driver receives a copy of the report, and data are stored in a system. Among the participating Member States, the systems recording RSI reports vary from the Excel sheet to databases. 63 % of the participating Member States record the RSI reports into a national system. For one (1) participating Member State, this information could not be collected.

International data exchange in the scope of RSI occurs when major or dangerous defects have been detected during RSI. In that case, the RSI report is sent to the competent authority of the Member State of registration of the vehicle. No participating Member States has put an automatic exchange process in place. This information exchange occurs via regular post or via e-mail.

Each Member State has to provide bi-annual statistics to the EU institutions. These statistics indicate the number of vehicles that were inspected in the scope of RSI, the number of prohibitions issued, filtered by registration Member State. A more detailed statistical report focuses on the defects leading to prohibitions. Participating Member States send these reports manually in the form of an Excel file.

3.3.4 International data exchange

MS already exchange vehicle related data at international level, using the systems described in section 3.2.2 'The existing systems'.
As an exception, figures represent here all Member States.
89% of the Member States have their vehicle registration register connected to the EUCARIS system.

78 % of the Member States are connected or plan to connect to RESPER via EUCARIS.
53% of the Member States are connected to ERRU through a direct connection (39%) and via EUCARIS (14%).

The following table provides an overview of the connection of the participating Member States to the systems. 'Member States in "acceptance"' means that they are in the final testing phase or waiting for legal implementation.

System	System connection	% MS in Production	% MS planned
EUCARIS	Vehicle register connected to EUCARIS	89%	11%
RESPER	RESPER via EUCARIS	14%	64%
	RESPER direct connection	4%	7%
ERRU	ERRU via EUCARIS	14%	21%
	ERRU direct connection	39%	14%

Table 3-3: All MS connection to existing systems.

3.3.5 Personal and sensitive data

The definition of personal data is relatively broad in EU legislation: "Personal data" means any information relating to an identified or identifiable natural person ('Data Subject'); an identifiable person is one who can be identified, directly or indirectly, in particular by reference to an identification number or to one or more factors specific to his physical, physiological, mental, economic, cultural or social identity.[41]

In relation to vehicle information exchange, the RSI report contains personal data in the form of the driver's name and the officer or inspector who has carried out the inspection. This data is considered personal, requiring specific protection measures in all MS who have responded to the related question in the questionnaire.

For other vehicle information data types, opinions are more diverse throughout the EU and it should be noted that even in cases when a certain data type is not considered as "personal data" falling within the scope of data protection legislation, it might still be regarded as "sensitive data" requiring a more careful exchange.

The VIN number used alone is considered as sensitive information by 53% of the responding Member States. In 10% of the responding Member States, the usage of the VIN is only considered as sensitive when used in combination with other data (vehicle make, license plate, first registration date).
The license plate number is considered as personal data in 11% of the participating Member States, while 47% of those Member States consider this data as sensitive.
One (1) responding Member State considers the odometer value to be personal data as well.

21% of the participating Member States did not provide information on the question of which data was considered personal or sensitive data.

[41] Opinion 4/2007 on the concept of personal data (01248/07/EN WP 136)

The following table provides an overview of the above.

Data name	% Sensitive	% Personal	% N/A (not available)
From MS QST			
License plate	47%	11%	21%
VIN	53%	0%	21%
VIN+Make	5%	0%	
VIN+ License plate + first registration date	5%	0%	
Odometer reading	0%	5%	
From RW package legislation			
Driver name	0%	100%	
Officer or inspector having carried out the inspection	0%	100%	

Table 3-4: personal and sensitive data among participating MS

3.3.6 Main practical problems encountered

Member States were asked what were the main practical problems encountered with respect to transmitting vehicle information to the authorities of other Member States.

Among the proposed list of possible problems, 74% of participating Member States identified the lack of vehicle information model at EU level as a medium issue.

About half (47%) of the participating Member States consider the lack of bilateral agreements or EU regulation as having a high impact on international data exchange, followed by the lack of vehicle information data and technical issues.

42% of the Member States consider that budgetary issues have a medium impact on international data exchange implementation.

The lack of centralised vehicle information has a medium to low impact for 32% of the participating Member States.

Two (2) Member States each identified one additional issue as having a high impact on international data exchange:

- lack of information about registration and de-registration of other Member States;
- legal issues.

Practical problem encountered	% responses	Average value	Average meaning
No formal vehicle information exchange model is defined at EU level	74%	1.79	medium
Bilateral agreements not available or EU regulation not in place	47%	1.33	high
Lack of vehicle information data	47%	1.89	medium
Technical issues	47%	2.56	medium/low
Budgetary issues	42%	1.75	medium
National vehicle information is not centralised	32%	2.50	medium/low

Table 3-5: Practical problems encountered with respect to international vehicle data exchange

3.3.7 Main requirements and suggestions issued by the Member States

On the question "Would you have specific requirements or suggestions for guidelines regarding the Vehicle Information Platform?" more than the half of the participating Member States (58%) suggests re-using the EUCARIS system. The re-use of EUCARIS doesn't only concern the system itself, but also includes the experience gained by Member States during the implementation and the usage of the system.

A common data format and data structure for data exchanges was also mentioned by 47% of participating Member States in order to facilitate international data exchanges. Also, the use of common open standards has been mentioned by 21% of the participating Member States. Establishing common rules for data usage, including data protection rules was mentioned by 16% of the participating MS.

16% of the participating Member States consider storing PTI technical data at national level.

11% of the participating Member States would request a single system for all international data exchanges. Concerning the number of connection points, 21% of the participating Member States would require a single PTI connection point while one (1) Member State requests multiple connection points.

16% of the participating Member States see a benefit in facilitating data exchange with vehicle manufacturers.

3.3.8 National initiatives for dealing with mileage fraud

Two Member States (Belgium and the Netherlands) have implemented the most representative specific systems for dealing with mileage fraud[42]. These systems are based on the periodical reading and storage of odometer data.
The Dutch system (Nationale AutoPass or NAP) was implemented early, at the end of the 1990s, and on a voluntary basis: it was seen as a label of quality delivered by automotive market stakeholders. Therefore the takeover has been slow, at the contrary of the Belgian system (Car- Pass) that was implemented as a legal obligation as from 2004[43]. After assessing the Belgian system, the Dutch authorities decided to adopt a similar approach as from 2014[44]. Therefore the private NAP organisation came to a governance contract with the public RDW acting on behalf of the Ministry of Infrastructure and the Environment, in order to take over the management of the database. The following focuses on the Belgian Car Pass system, which presents similar characteristics, data and results.

In Belgium, according to the federal law of 11/06/2004,

- Mileage fraud is considered a serious crime sanctioned with severe penalties (up to 1 year imprisonment)
- A central database containing the odometer readings of all vehicles registered in Belgium was created. A non-profit organization (Car Pass) was authorised by Royal Decree to manage this database

[42] E-REG (2014), EReg Topic Group XIII - Vehicle Mileage Registration Final Report April, version Draft 0.7, April 2014. In addition to BE and NL, there are some initiatives in other countries that prevent, prohibit and prosecute mileage fraud (DE, DK, FI, HU, IE, SK, PL)
[43] Belgian Federal Law of 11 June 2004
[44] Dutch law of 1 January 2014

- All PTI centres, professional car dealers and repair shops are required to transfer VIN number, mileage and date when inspecting, repairing or maintaining a vehicle or replacing parts (e.g.. tyres, windscreens, etc…)
- The seller of a second hand vehicle has the legal obligation to deliver a certificate showing the mileage history of the vehicle to the buyer. If he fails to do so, the transaction is not valid.

All stakeholders are represented in the Car-Pass management board, making it a public-private partnership:

- Association of the car importers (FEBIAC)
- Association of the dealers, repair shops, etc… (FEDERAUTO)
- Association of the companies performing the technical inspection (GOCA)
- Associations of motor car users (Touring, VAB)
- Ministry of Economic Affairs
- Ministry of Transport

The system presents itself as cost-efficient and self-supporting. There are almost no extra administrative burden since recording mileages is common practice in the automotive business (VIN and dates are existing data in the Dealer Management Systems). The Car-Pass operational costs are € 3 million yearly. The sale of the mileage certificate (€ 7.00) is the only revenue. There is no public funding. After 8 years in operation, the database centralises 150 million odometer readings from 11,000 different sources. PTI centres are the source for 34.6 % of odometer readings. At the introduction of the system, more than 60,000 "rolled back" odometers were discovered, representing nearly 10% of used car transactions (750,000 per year). In 2013 the number of discovered fraud was dramatically reduced (by 98%) to only 1,085, representing 0.15% of used cars sales.

4 Functional analysis of the VIP

This section presents the functional analysis of the VIP. Functional requirements have been grouped into general functional requirements, future functionalities have been identified, taking into account the stakeholders and data entities needed. Non-functional requirements as well as legal requirements have also been identified. All this information leads to the description of future international vehicle information exchanges and what responsibilities stakeholders would have at international level.

4.1 General functional requirements

From the new RW package, general functional requirements were derived, describing the main functionalities of the VIP in the scope of vehicle international data exchange.

In the scope of re-registration, the legislation requires the previous registration data, CoC and latest RW certificate to be available electronically in order for the registration authorities to perform vehicle re-registration.

With the objective of future mutual recognition of PTI across the EU, the following information needs to be exchanged: RW certificate, CoC and additional technical data for the purpose of PTI. The latter should be made available by vehicle manufacturers via a single access point.

In the scope of the RSI business procedure, all needed data should be available from all Member States in order for the inspector to perform RSI activities, including the undertakings risk rate, RW certificate and RSI reports as well as notification for requesting additional technical inspection.

Accident information data is also requested with the objective of providing information in an anonymised form on the main safety-related components and odometer readings of vehicles which have been involved in serious accidents for purposes of consumer protection.

The following table provides an overview of the detailed general functional requirements identified, and the business domain (registration, PTI or RSI) they are applied to. A detailed description and source of each of requirement can be found in annex 8.10.1 General functional requirements.

ID	Short description	Business domain
FR01	Exchange additional technical data for the purpose of PTI.	PTI
FR02	Exchange PTI and RSI data	PTI, RSI
FR03	Storage of information related to accidents	Consumer protection, PTI
FR04	Link existing systems	All
FR05	Mutual recognition of PTI	PTI
FR06	Exchange of: - registration data, - CoC, - RW Certificate, - technical data for PTI.	Registration, PTI, RSI
FR07	Electronic exchange of RW Certificates	Registration, PTI, RSI
FR08	Send RW Certificate after PTI with accompanying optional information about vehicle use suspension	PTI
FR09	Check RW Certificate during RSI	RSI
FR10	Check previous RSI report during RSI	RSI
FR11	Send RSI test report in case of major or dangerous deficiencies	RSI
FR12	Send RSI notification to take appropriate follow-up action in case of major or dangerous deficiencies	RSI
FR13	Bi-yearly RSI statistics for Commission	RSI
FR14	Exchange risk rates	RSI
FR15	Possibility to check RW certificate during re-registration	Registration
FR16	Possibility to retrieve previous RW Certificate	Registration, PTI, RSI
FR17	Vehicle End-of-Life notification	Registration
FR18	Single point of access for PTI technical data	PTI

Table 4-1: VIP Functional requirements overview

4.2 User needs

User needs analysis lead to the description on functionalities the VIP will need to be implemented. Based on the data entities and stakeholders identified, functionalities are described in a more detailed manner through use-cases.

4.2.1 Data entities

Data requirements describe data to be exchanged and are derived from the analysis of the international data exchange as described in the new RW package. Data entities are groups of data that are used by the stakeholders in order to perform their activities, including data exchange.

Data needed for international data exchange throughout the vehicle life cycle may be divided into four main categories, depending on the moment in the vehicle life cycle they are needed. The four main categories are the following:

- Registration;
- Periodical technical inspection;
- Roadside inspection;
- Accidents.

For each category, specific data entities have been identified. The following picture gives an overview of all the entities per category:

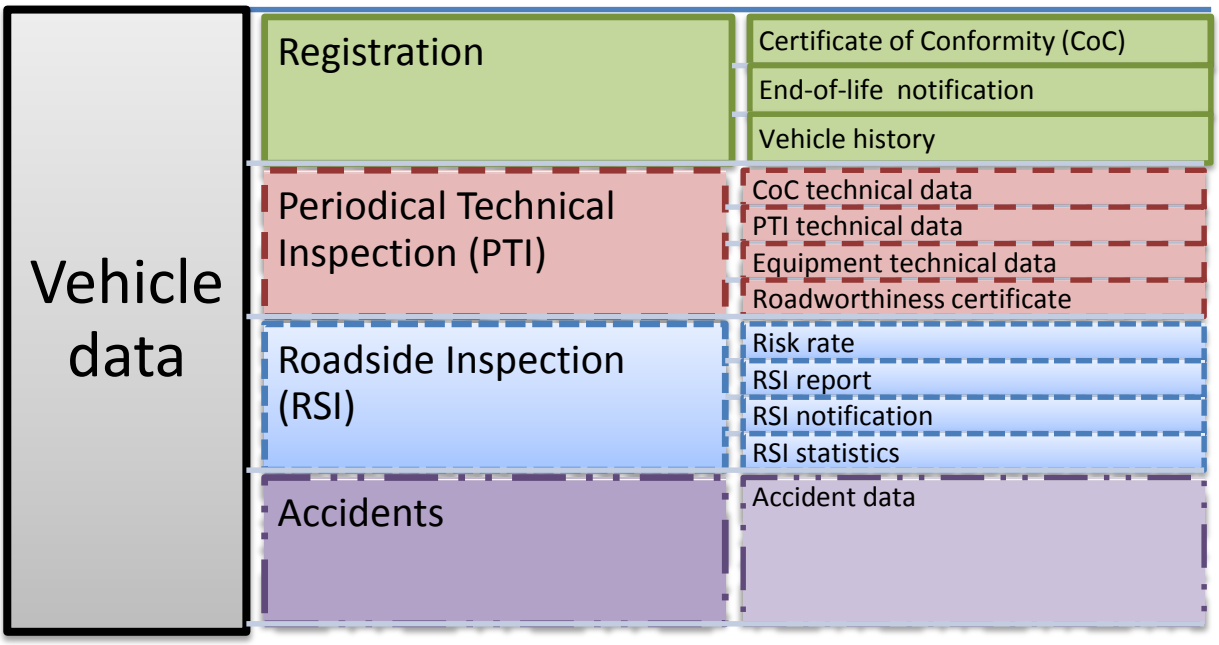

Figure 4-1: VIP data entities

Beside these data entities, data entities related to the VIP usage have also been identified and are further described.

1 Certificate of Conformity

Based on the EU legislation (2007/46/EC[45]), the Certificate of Conformity (CoC) is the document set out in Annex IX, issued by the manufacturer and certifying that a vehicle belonging to the series of the type approved in accordance with this Directive complied with all regulatory acts at the time of its production.

2 Certificate of Conformity technical data

The Certificate of Conformity (CoC) technical data is a subset of the CoC data necessary for PTI centres to perform technical inspection.

3 Vehicle end-of-life notification

This notification contains all necessary data mentioning a vehicle has been treated as end-of-life.

4 Periodical technical inspection technical data

Vehicle periodical technical inspection (PTI) technical data is a set of technical information on braking equipment, steering, visibility, lamps, reflectors, electrical equipment, axles, wheels, tyres, suspension, chassis, chassis attachments, other equipment and nuisance that is necessary for the execution of PTI.

It also includes all information needed by PTI centres to verify the functionality of electronically controlled units (ECU). As PTI technical data continuously evolve, this information has to remain the ownership of the vehicle manufactures.

At the time of writing, the list of data, data format and data structure is not fixed by any regulation yet. A feasibility study has been conducted in parallel to this study in order to identify test procedures and set-up testing tools with the objective of testing ECU's functionalities. This study will lead to the identification of data needed for the execution of these new tests.

A more detailed description of this data entity can be found in annex 8.1.2 'Data entities'.

5 Equipment technical data

The equipment technical data is the set of information needed for test equipment manufacturers to set-up and maintain testing tools. It includes the following kind of information:

- Technical information on braking equipment, steering, visibility, lamps, reflectors, electrical equipment, axles, wheels, tyres, suspension, chassis, chassis attachments, other equipment and nuisance necessary for the execution of PTI.
- Electronic Controlled Unit (ECU) technical information and documentation needed.

The list of data, data format and data structure is not fixed by any regulation yet.

At the time of writing, a feasibility study is being conducted in parallel in order to identify test procedures and set-up test tools with the objective of testing ECU's functionalities. This study will lead to the identification of data needed for the execution of these new tests.

[45] Directive 2007/46/EC of the European Parliament and of the Council of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles, OJ L 263/1 of 9.10.2007

6 Roadworthiness certificate

The Roadworthiness (RW) certificate is a 'roadworthiness test report issued by the competent authority or a testing centre containing the result of the roadworthiness test'. The RW certificate mentions mainly the outcome of the test, odometer value and validity date. In case of dangerous deficiencies found during PTI, the RW certificate is accompanied with information about vehicle use suspension (or lifting this suspension in case these deficiencies are proven to be removed).
They are collected and kept in a centralised database at national level with the same level of detail than the original test certificate.

7 Risk rate

The risk rate for an undertaking is calculated on the basis of the number of deficiencies found during previous inspections (both PTI and RSI), the severity of those deficiencies, the number of technical roadside inspections or PTI performed and a time factor.

8 Roadside inspection report

The Roadside inspection (RSI) report issued after each RSI mentions the output of the inspections performed. It mentions the overall result of the inspection as per EU legislation.

9 Roadside inspection notification for requesting measures

When the overall result of a Roadside inspection (RSI) is negative, the Member State performing the RSI may notify the Member State issuing the registration certificate to request measures to be taken regarding the offender. The content of this notification is still to be defined at EU level. This data entity should contain at least the notification id, the RSI report reference and measures to be taken.

10 Roadside inspection national statistics

Each Member States is required to send bi-yearly statistics to the EU institutions. These statistics contain two types of reports. The overview report provides the number of RSI performed and prohibitions issued for the past 2 years, split by Member State and per category of vehicle. This report is completed with detailed reports on the noted defects leading to prohibitions issued during RSI performed. These detailed reports are split by registration issuing Member State, vehicle category and type of defects identified.

11 Vehicle history

In the scope of consumer protection, the new RW package mentions that vehicle history should be available to holders of vehicle registration certificates. In order to implement this requirement, the need for this data entity was identified. The vehicle history data entity aims at collecting all events that are linked to odometer recording since the vehicle's first registration. Events currently identified are the following: first registration and re-registration, PTI, RSI, serious accident (including information on main safety-related components), and end-of-life. For each event, the following data should be recorded: date of event, type of event, MS of event and odometer value. Information on accident events should include the information on the main safety-related components. When available, modifications that are recorded by the registration authority may also be part of the vehicle history data entity. Further details on the content of this data entity needs to be defined during the implementation of this data exchange.

12 Vehicle Information Platform usage statistics

VIP usage statistics concern information on the system usage and performance, for regular follow-up as well as system and usage statistics providing input to the directive implementation report. These data are based on system logging and monitoring information that are used for day-to-day operations and follow-up. They are non-functional data, beside the business data described above.

An example of a regular follow-up report covers the availability of the system and its performance on a weekly basis.

An example of a statistical report is the follow-up on the number of messages exchanged, sorted per kind of message and per Member State.

Further details will need to be specified during implementation of the platform.

Section 8.10.2 'Data entities' in the annex provides more detailed information about the data entities.

4.2.2 Stakeholders

This section gives a generic description of all stakeholders identified through the RW process. Each stakeholder is described at a functional level, without taking into account the practical organisation in each Member State.

Because each Member State has its own national structure and organisation, national stakeholders have been grouped into organisations as follows:

- Registration organisation: groups all stakeholders active in the registration process, mainly registration authority.
- PTI organisation: groups all stakeholders active in the PTI process, mainly PTI authority and PTI centres.
- RSI organisation: groups all stakeholders active in the RSI process, mainly RSI authority and RSI inspectors.
- Accident information provider: generic term for bodies centralising accident information at national level.

Apart from national stakeholders there are international private and public stakeholders: Vehicle Manufacturer, Vehicle Testing Equipment Provider, EU Institutions, VIP operator – their descriptions can be found in section in annex 8.10.3 'Stakeholders description'.

The following picture gives an overview of active stakeholders in the roadworthiness activities at EU level.

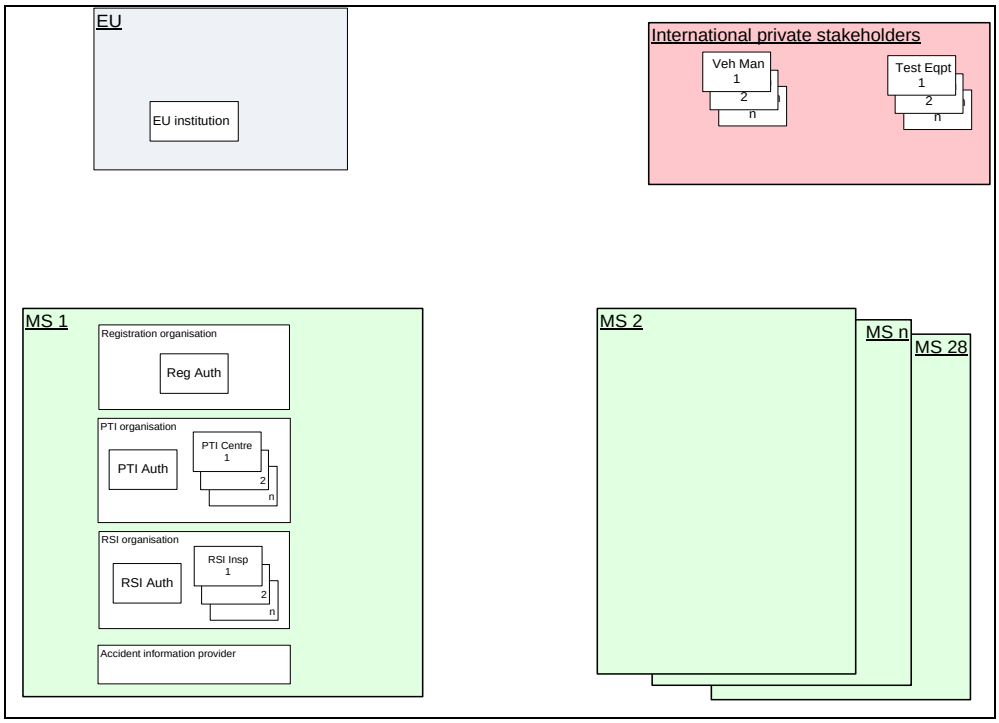

Figure 4-2: Stakeholders overview

The registration organisation, mainly consisting in the registration authority, is responsible for issuing registration certificates to the registration holders. They own all registration related data. At national level, they mainly communicate with PTI centres by providing them CoC technical data needed for PTI, and getting RW certificates issued after PTI execution. At international level, they communicate with other Member States' registration authorities in the scope of the re-registration process as well as vehicle end-of-life notification and act as national contact point for registration data exchange. Taking into account the new identified need for vehicle historical data collection and transmission, registration authorities would be responsible for the international data exchange of this data.

The PTI organisation deals with the whole PTI process for which two main actors have been identified: the PTI authority and PTI centres. PTI authorities are responsible for the enforcement of the EU and national PTI regulations for all concerned vehicles. They authorise testing centres and PTI inspectors to perform PTI.
At national level, they provide registration organisation with the RW certificates.
At international level they act as a national contact point for PTI data exchange. With the future objective of mutual recognition of PTI across the Member States, all national interactions should occur at international level, meaning that RW certificates should be available to all organisations of other Member States. In some Member States, PTI authorities require a close control of PTI centres' activities. That's why they may provide the access for PTI centres to vehicle manufacturers PTI technical data.

PTI centres are responsible for technical inspection execution. In that scope, they communicate with the national registration authority in order to get the CoC technical information they need for their activities. All issued RW certificates are sent to the PTI authority for centralised storage. The PTI authority could also provide them with access to the vehicle manufacturers' website.

At international level, they communicate with vehicle manufacturers in order to get the PTI technical data needed for their activities.

The RSI organisation, regrouping the RSI authority and RSI inspectors is responsible for the entire RSI process. The RSI authority is responsible for the enforcement of EU and national RSI regulations for all concerned vehicles. At national level, they gather the RW certificate from the PTI authority. At international level, RSI authorities exchange calculated undertakings' risk rates, as well as RSI reports and notifications for requesting measures with RSI authorities from other Member States. They also request the RW certificate from the PTI authority of the vehicle's registration Member State. The RSI authority acts as a single national contact point for RSI related information exchange.
The PTI inspectors are responsible for RSI activities, requesting previous risk rate, previous RSI report and previous RW certificates from RSI and PTI authorities respectively. They provide the RSI authority with the RSI report and possible notification for measures to be taken.

In order to provide anonymised accident data to the EU institutions, the study identified the need for a single national accident information provider. This stakeholder does not exist as such and should be appointed. The role of this stakeholder is to gather and centralise all information concerning vehicles involved in serious accidents with the objective of providing anonymised accident information to the vehicle registration owner, accident researchers and PTI inspectors.

Outside national organisations, three (3) stakeholders acting mainly at international level have been identified. Vehicle testing equipment manufacturers are private companies providing testing centres and garages with vehicle testing equipment. They need vehicle technical data in order to set-up, test and maintain their vehicle testing equipment in accordance with the specifications provided by the vehicle manufacturers.

Vehicle manufacturers are private companies acting at international level. With respect to the new PTI tests described in the new RW package, they provide access for PTI centres to vehicle specific technical data needed to perform PTI. They also make equipment technical data available for test equipment providers.

As part of the input related to policy making, EU institutions collect reports and statistics. Beside RSI bi-yearly statistics that are provided by the Member States, VIP usage and statistical reports are also part of the information exchanged. VIP usage reports and statistics are provided by the VIP operator which is responsible for the operational and maintenance activities of the VIP.

A detailed description of each stakeholder can be found in annex 8.10.3 'Stakeholders description'.

4.2.3 VIP functionalities

Based on the analysis of data and stakeholders identified in the previous sections, this section describes what functionalities are needed in the scope of the VIP with regards to the new RW package.

The following table provides an overview of the functionalities to be implemented by the VIP in the scope of the registration, PTI and RSI processes.

Functionalities to be implemented by the VIP …	… in the scope of
Retrieve and store CoC from previous registration.	Registration
Verify latest RW certificate.	Registration, PTI and RSI
Send/Retrieve vehicle history, including information on accidents and odometer readings	Registration
Notify vehicle has been treated as end-of-life.	Registration
Retrieve equipment technical PTI data from vehicle manufacturers.	PTI
Setup access rights for PTI centres to vehicle manufacturers technical information (depending from the national setup).	PTI
Retrieve vehicle specific PTI technical data from vehicle manufacturers.	PTI
Retrieve CoC technical data for the purpose of PTI execution.	PTI
Verify undertaking's risk rate	RSI
Send and retrieve RSI report to competent authorities.	RSI
Notify other MS competent authority on measures to be taken	RSI
Send bi-yearly statistics on RSI to EU institutions	RSI
Generate statistics on VIP usage and make them available to EU institutions	VIP operations

Table 4-2: List of functionalities to be implemented in the scope of the VIP

These functionalities lead to the definition of use-cases, describing the detailed interactions and data needed to perform a specific objective. The implementation of a use-case enables the user to perform a specific activity.
Further details on the description of the functionalities and use-cases may be found in annexe 8.10.4 'Functionalities'.

4.3 Non-functional requirements

Non-functional requirements define criteria related to the implementation and development of a system, the performance, maintenance and operations. From the new RW package, the re-use of existing IT solutions with regards to international data exchange is a strong requirement. In the scope of RSI, the re-use of the ERRU system is specifically mentioned. Concerning the communication with vehicle manufacturers, the VIP should provide a single point of access for Member States to these systems, applying the same principles currently in place for the RMI systems set-up by the vehicle manufacturers.

As part of system implementation best practices, a monitoring system is needed for performance and usage follow-up by the operational team. The data gathered are used to provide regular statistical reports on usage and performance to the EU institutions.

More detailed information of these requirements may be found in annex 8.10.6 Non-functional requirements.

4.4 Legal requirements

Both EU and national vehicle information legislations need to be considered during the development of the recommended solution for this study.

The following principles are to be respected for any recommended solution:

Subsidiarity principle

The subsidiarity principle applies insofar as the vehicle information platform does not fall under the exclusive competence of the Union.

The objectives cannot be sufficiently achieved by the Member States alone for the following reason: information exchange is either non-existing or implemented in different ways by Member States leading to a high discrepancy in enforcement of the roadworthiness testing and roadside inspection regime with negative impacts both on road safety, the environment but also on the internal market.

A future seamless flow of information between Member States on vehicle registration would require the existence of a vehicle information platform of this nature at EU level. Local initiatives alone would not suffice.

Proportionality principle

The Vehicle Information Platform must comply with the proportionality principle.

It should not go beyond what is necessary in order to achieve the objectives of increasing road safety and environmental protection by proposing a vehicle information platform that can enable a seamless flow of information in a cost-effective and efficient manner.

Beside the EU and national legislations concerning registration, PTI and RSI, some key legal requirements were identified, mainly derived from the key fundamental rights as information is shared between the wide arrays of stakeholders across the EU.

Those requirements mainly focus on the definition of the data usage common rules taking into account the purpose limitation as well as the data privacy aspects. These include the security measures to be taken in the scope of the data exchange of personal data. On top of this and because private stakeholders are concerned by the VIP, the respect for data ownership, trade secrets, patents and copyrights also needs to be taken into account.

More detailed information on the identified legal requirements may be found in section 8.10.8 'VIP legal requirements'.

4.5 Requirements towards Member States

The new RW package also mentions requirements towards the Member States. Although the present study doesn't discuss in-depth national organisations and requirements, they are part of the requirements towards the VIP. Requirements towards Member States focus on electronic and centralised storage of registration, PTI and RSI data as well as a single national contact point for PTI and RSI authorities. More detailed information on the requirements and their sources can be found in annex 8.10.7 'Requirements towards Member States'.

4.6 Initial conclusions related to the business needs for the VIP

Based on the analysis of the business needs for the VIP, some initial conclusions may be drawn that clarify the scope of the VIP:

1 There will be no central EU database.

Some Member States indicated that it might be more efficient and effective to organise vehicle information via an EU level centralised database. At this stage however, there is no EU legal basis for a central EU database.

Conclusion: The VIP will not store any vehicle information centrally. It will be an information exchange platform.

2 The retrieval of CoC data from vehicle manufacturers is out of scope of the VIP

Due to specific national needs, some Member States currently require that vehicle manufacturers electronically deliver additional data together with the CoC. For those Member States, such electronic information exchange is already implemented. Benefits for the provision of a central communication point for this data exchange were not identified. Instead, two disadvantages were found:

- from the of information processing point of view the central communication point is less reliable, less efficient and less scalable than multiple independent communications points,

- the implementation of the central communication point for exchanges of CoC seems to be not respecting the subsidiarity principle.

Conclusion: This exchange is assessed to be out of scope of the VIP. In parallel it is recommended to design community standards for this data exchange in order to facilitate further data exchange between the Member States.

3 There are no detailed technical requirements for a central access point for vehicle manufacturers

Article 4(3) of the new RW package on PTI[4 above] mentions that the RMI principles should be applied for the communication between the vehicle manufacturers and the Member States. RMI principles[37 above] describe common rules for accessing the relevant information via vehicle manufacturers' websites.

Because no specific requirements are defined at the time of writing, the new regulation foresees the following to be defined by means of implementing acts:

- Set of technical information needed for the needed for PTI tests
- Detailed rules concerning the data format and the procedures for accessing the relevant technical information.

It should be noted that during the meeting of the Roadworthiness Committee at the EU Commission on 20th May 2014, a workgroup was established with the objective of defining data, data formats and procedures for the data access to vehicle manufacturers' websites.

Conclusion: Based on the directive, vehicle manufacturers have to make PTI related data available via a website. At the time of writing, no specific requirements regarding access rules and data format for this functionality have been defined. Therefore, the VIP access to vehicle manufacturers' PTI technical information may only be limited to the redirection of the requests to the relevant websites of vehicle manufacturers.

4 PTI technical information is not stored at national level

Some Member States expressed the need to have PTI technical data stored at national level. PTI technical data includes data related to the electronic equipment of the vehicle. Because this data may be updated during the vehicle's life cycle (e.g. update of OBD software), it would mean that these updates should be reflected at national level as well. The maintenance of this type of information in national databases is not foreseen by the new legislation. Additionally, vehicle manufacturers have the ownership and the intellectual property rights over some of the technical information they develop. Currently there is no business case, or general legal basis forcing the vehicle manufacturers to provide this information to national governmental authorities, nor to allow them to store this information at national level.

On top of this, it would go against the general principle that the owner of the data is best placed to be responsible for the data quality and accuracy.

Conclusion: PTI technical data may not be stored at national level.

5 Interactions between citizens, companies and national authorities are considered as national information exchanges

Based on the principle of subsidiarity, the information exchange from a citizen or a private company towards one of the registration, PTI or RSI national authorities are considered as national data flows. In this case, the role of the EU is to facilitate the communication between Member States.

For example, in case a vehicle is treated as end-of-life in another Member State than the one the vehicle was registered, it is assumed that the relevant registration authority will be notified by the registration authority of the Member State where the vehicle was treated as end-of-life, using the VIP communication channel. This is supported by the flow "end-of-life" notification data flow.

Conclusion: In the scope of the VIP, it is assumed that communication between citizen or company and national authority of another Member State will be done via the relevant authorities of the concerned Member States.

6 The exchange of vehicle history data should be gradual and start with the odometer readings.

In the scope of consumer protection of the registration owner, the VIP foresees to provide the registration owner with information on odometer readings and accidents involving the vehicle.

The costs and benefit analysis (see analysis details in section '8.16 Costs and benefits analysis of collecting information on odometer readings and vehicle accident history') showed that in order to avoid the implementation of a system that would be too ambitious, too expensive and to complex from scratch, collecting and storing odometer data should be the starting point as it is simple, inexpensive, efficient and self-supporting in terms of the budget. That approach was already proposed under the Belgian presidency, but at that time no consensus could be reached[46]. At the time of writing, it seems that such approach will be supported by the Member States, by collaborative automotive stakeholders from the private sector and rapidly supported by users/consumers. EReg (Association of European vehicle and driver registration authorities) also supports and recommends focusing on fighting mileage fraud[47].

The support towards the system will be reinforced as soon as it demonstrates its efficiency, even in the hesitating Member States.

Conclusion: In scope of the VIP, the first implementing step relative to odometer readings may be supported by the data named 'vehicle history'. The VIP should focus on the exchange of odometer readings in the first place. The extension of the vehicle history with additional information should be considered after successful implementation of the exchange of odometer readings.

[46] According to the interview of Mr Francis Derycker (Cabinet of Belgian Vice-Prime Minister Kriss Peeters) this was due – in 2010 - to uncertainties regarding who could take leadership at the European Commission level: the matter is indeed not only covering security and mobility but also consumer protection, fighting criminal fraud and fair competition. It was also due to the lack of enthusiasm of some Member States, but this is now changing after assessing the positive outcomes of the Car-Pass system: the Netherlands adopted it in 2014, Luxembourg would be about to take a similar decision and Member States consider odometer tampering as a crime.

[47] E-REG (2014), EReg Topic Group XIII - Vehicle Mileage Registration Final Report April, version Draft 0.7, April 2014, page 22.

4.7 Vehicle life cycle with the VIP

As a conclusion, the following picture gives an overview of the international data exchanges taking place in the scope of the VIP during the vehicle life cycle. Because each MS has its own national structure in terms of organisation, all national stakeholders have been grouped according to their domain of functional activity.

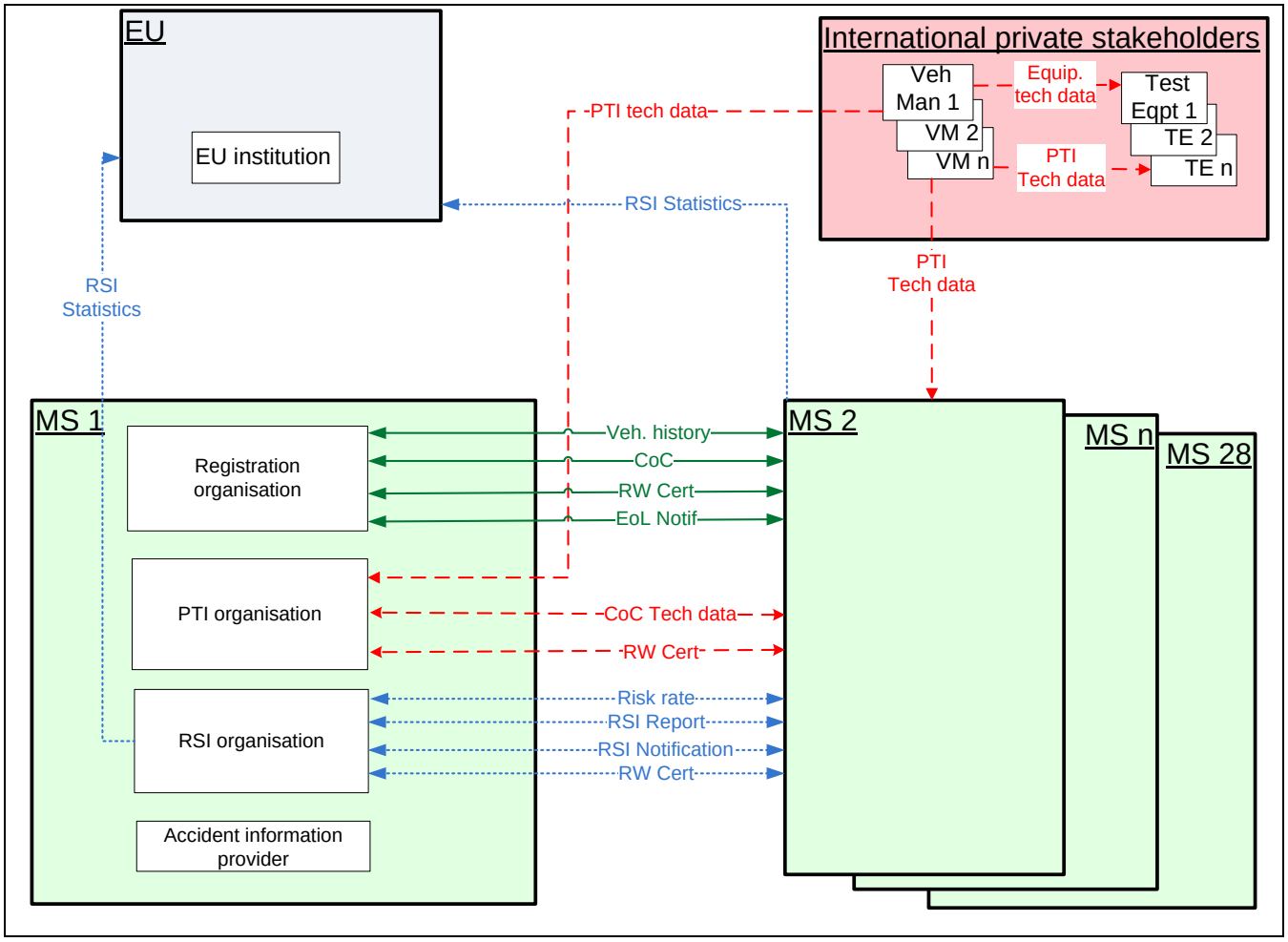

Figure 4-3: VIP Business data flows overview

The data flow represented by full line arrows shows data entities exchanged in the scope of the registration process.
The data flow represented by dashed arrows shows data entities exchanged in the scope of PTI. One important flow concerns the communication of PTI technical data from the vehicle manufacturer to the PTI centre. Other flows concern data exchange between Member States.
The data flow represented by dotted arrows shows data entities exchanged in the scope of the RSI process. This flow only concerns data exchange between Member States.
The VIP usage statistics data flow is not shown in this figure. This flow concerns the VIP operator sending regular statistics to the EU institutions, and is not purely related to the vehicle life cycle business information data exchange. These flows are discussed hereafter.

4.7.1 International data exchange related to registration

Among the information required by registration authorities for the registration process, two main data entities are needed for vehicle registration in the scope of the VIP: the certificate of conformity (CoC), and the latest roadworthiness (RW) certificate.

In case of re-registration, the new legislation mentions that the latest RW certificate is needed. Depending on national legislation, the Certificate of Conformity (CoC) may be required for re-registration. During our interviews, it appeared that, when available, registered modifications applied to the vehicle should also be part of the re-registration data. If re-registration occurs in another Member State than the previous registration, all this information needs to be transmitted between the registration authorities. Because the possible registered modifications applied to the vehicle are part of the vehicle history data, this data entity also needs to be transmitted between registration authorities at the time of re-registration.

As part of the findings of the study in the scope of consumer protection, it appeared that historical information of a vehicle would also need to be available to the vehicle's registration document holder. As previously mentioned, this data entity lists all the events that are linked to odometer readings, including possible vehicle's recorded modification and accidents. Consequently it is recommended that in the scope of the re-registration process, this information is transmitted to the registration authority together with the previous RW certificate and the CoC when available.

When a vehicle has been treated as end-of-life, the relevant competent authority is notified and the registration is cancelled permanently.

4.7.2 International data exchange related to PTI

Two main flows have been identified concerning international data exchange related to PTI:

- Equipment technical information exchange between vehicle manufacturers and test equipment providers.
- Data exchange occurring at the moment PTI is performed.

Equipment technical data exchange.
New testing procedures will include functional tests of the electronic equipment installed on a vehicle. Specific testing tools and test procedures need to be set-up, tested and maintained by testing tools providers. Therefore, documentation and technical data on electronic equipment is needed from the vehicle manufacturers as well as PTI technical data.

Data exchange at the moment PTI is performed.
New technical inspection tests will include the verification of electronic equipment installed on the vehicle. Therefore, VIN related technical data is needed to perform relevant tests. Technical data needed are split into 2 parts:

- CoC related technical data: technical information contained in the CoC and made available by registration authorities.
- PTI technical data to be provided by vehicle manufacturers.

The PTI technical data could be provided by vehicle manufacturers in the form of a file that can be uploaded into the testing tool(s).
Because there is no legal obligation for vehicle manufacturers to provide CoC after first registration, this information should be provided by the registration authority.

Additionally PTI testing centres also need to have the ability to verify odometer values against the previous certificate.

When PTI is completed, a RW certificate is issued and given to the driver of the car. All information on the RW certificate is stored in the national database. Because of possible future full mutual recognition of PTI throughout the EU, CoC technical data and RW certificate data are part of the international data exchange flow. For the enforcement of PTI results purpose and in case dangerous deficiencies have been noted during PTI, the RW is accompanied with information about vehicle use suspension (or lifting this suspension in case these deficiencies are proven to be removed).

4.7.3 International data exchange related to RSI

The identification of vehicles subject to RSI is partially based on a risk profile analysis. Therefore, the RSI organisation will need to have the risk rate of the undertaking available. In case the undertaking is established abroad, the relevant competent authority abroad has to provide this information.

During roadside inspection, inspectors will perform technical inspection of the vehicle as part of other verifications that take place. The technical inspection includes the verification of the latest RW certificate and the most recent RSI report. These documents have to be on board. Member States may allow their authorities to accept an electronic evidence of those documents. This is the reason why the RW certificate and the latest RSI report may be requested to the competent authorities of the registration Member State.

In case serious defects have been detected, the Member State issuing the registration certificate needs to be informed by sending the RSI report. On top of this, the inspector may request additional inspections to be performed on the vehicle. Therefore, a notification requesting additional measures to be taken may be sent to the competent authority of MS where the vehicle is registered.

Every two years, each MS is required to send statistical reports to the EU institutions. Two parts of the report are expected. The national overview report shows statistics on the number of vehicles checked and the number of prohibitions issued. This report is sorted per defined vehicle category.
The national detailed report focuses on the prohibitions per defect. It is split per vehicle registration issuing Member State of vehicles checked. For each defined vehicle category, the number of prohibitions per type of defect that have been issued is reported.

4.7.4 Other data flow

One additional data flow has been identified related to the VIP usage reports and statistics for the EU institutions. These reports are required for VIP performance follow-up purposes as well as for partial input to policy making at EU level. These statistics are provided by the VIP operator on the basis of VIP logging and monitoring data and sent to the EU institutions.

4.8 Possible organisational arrangements

4.8.1 VIP stakeholders' responsibilities

Based on the principle of subsidiarity, the information exchanges from a citizen or a company towards one of the registration, PTI or RSI authorities are considered as national data flow. The role of the EU is to facilitate the communication between Member States. Therefore in the scope of the VIP, it is assumed that communication will occur between the relevant authorities of the concerned Member States.

In order to implement these international data exchanges, responsibilities sharing between stakeholders need to be clearly identified. Beside responsibilities linked to data ownership (described in section '4.2.2 Stakeholders'), responsibilities of data communication have to be shared between all stakeholders.

The EU institutions:

- Facilitate vehicle information exchange between Member States:
  - Are responsible for the EU network.
  - Take the responsibility of data transiting on the network.
  - Ensure data protection rules are respected over the EU network.
  - Are responsible for defining the interface between the set of system components under their responsibility (EU domain) and the set of system components under national responsibility (national domain).
- Are responsible for the management of VIP, including usage and performance follow-up and statistics.
- Are responsible for the central connection point for vehicle manufacturers.

Each Member State is responsible for:

- The data owned by all relevant national stakeholders. Each authority is responsible for the data they own.
- The connection and data exchange between their national registers and the VIP connection point through their own national network.
- The security over their national network.
- Sending relevant reports and data to the EU institutions
- Responding to relevant queries from other Member States' authorities. The following table shows, for each data entity needed by Member State, the owner and the access needs by the authorities of other Member States.
- Implementation and control of national data flows.

Data entities	Data owner	Member States' authorities data needs		
		Registration	PTI	RSI
Certificate of Conformity	Registration	Y	Y	
Certificate of Conformity technical	Registration	Y	Y	

Data entities	Data owner	Member States' authorities data needs		
		Registration	PTI	RSI
data				
Vehicle history	Registration	Y		
Vehicle end-of-life notification	Registration	Y		
Vehicle PTI technical data	Vehicle Manufacturer		Y	
Roadworthiness certificate	PTI	Y	Y	Y
Undertaking Risk rate	RSI			Y
RSI report	RSI			Y
RSI notification for requesting measures	RSI			Y

Table 4-3: Member States' authorities data needs

Vehicle manufacturers:

- Provide CoC data for each vehicle put into service in the EU, PTI technical data as well as vehicle equipment technical information.
- Are responsible for making PTI technical data available to PTI centres and technical equipment providers.

VIP operator:

- Operate the system, ensuring performance, availability and user support.
- Provide usage reports and statistics to the EU institutions.

4.8.2 Responsibilities inside Member States

Because each Member State has its own organisation, responsibilities and data flows at national level are discussed from a generic functional point of view.

As a principle, all registration data related to one vehicle are stored in the Member State of Registration. Inside a Member State, each authority is responsible for the data it owns as shown in the previous table.

In order to communicate with the VIP, Member States need to implement a physical connectivity through one or more national VIP connection points. A national VIP connection point enables a national register to communicate with the VIP. Based on the national organisation, each Member State may decide to implement a single or multiple VIP connection points:

- Implementing a single VIP connection point means that
  - a single national authority manages the VIP connection point.
  - all national registers are connected to that VIP connection point
  - all international data flows go through that single VIP connection point
- Implementing multiple VIP connection points means that
  - Each authority manages its own VIP connection point.
  - Each national register is connected to the VIP connection point owned by the national authority they belong to

- Each international data flow goes through the VIP connection point managed by the authority owning the data concerned by the flow.

When coming to the data flows inside the Member States, the national organisation has an impact on the current national channels in place. In the scope of the VIP, functional national data flows between the national registers and identified users and stakeholders take into account the following assumptions:

- Each user belongs to a national authority and accesses the system via the national system owned by the relevant authority. So a registration officer accesses vehicle information through the registration system, a PTI inspector accesses vehicle information via the PTI system and an RSI inspector accesses the needed information via the RSI system.
- When data is needed from another register, this data will be available to the user through the system the user is normally connected to. It is considered that data communication between national registers is in place.
- Data entities are stored in the system owned by the relevant authority based on the Table 4-3.
- PTI technical data needed for PTI activities are not stored at national level as they are owned by the vehicle manufacturers.

Taking into account data ownership, national connectivity to the VIP through the national connection point(s), the following conclusions may be drawn:

1. The national information flows mainly depend on:
    a. The national organisation of the different authorities and registers.
    b. Current communication channels between existing national registers.
2. It seems that the national communication flows can be simplified in case the registration register and PTI register are physically in the same system.
3. National communication flows can be even more simplified in case RSI reports are kept in the same register as RW Certificates.
4. In order to exclude redundancy it is recommended to reuse existing national communication channels.
5. The number of connection points to the VIP can vary from Member State to Member State.
    a. The maximum connection points to the VIP will be needed in case each register (registration, PTI and RSI register) would need to be connected to its specific VIP connection point.
    b. A single VIP connection point means that all registers are connected to the same VIP connection point.
    c. In the case all registers are physically centralised, only one system would need to be connected to the VIP connection point.
    d. Technically it is possible that only one register is connected to the VIP, providing the relevant services for the VIP connectivity to other national registers.

Section 8.11 ‘Responsibilities inside MS’ describes in more details the responsibilities inside the Member States as well as the possible national data flows.

5 Technical analysis of the VIP

The technical analysis of the VIP is based on the output of the previous functional analysis, leading to the identification of business flows. The technical analysis of these flows lead to the identification of three types of technical flows, serving as basis for the suggestion of the options for the VIP.

5.1 Technical analysis of the business flows

5.1.1 Data flows characteristics

Based on the business flows identified in section ‘0

Vehicle life cycle with the VIP', the identification of technical requirements for these flows are based on the analysis of the following non-functional characteristics:

- Capacity – to determine expected level of traffic and required bandwidth.
- Performance – expected response time.
- Stakeholders (actors) – identification of the type of actors and direction of the data exchange.
- Data sensitivity – data protection needs for the data exchange.
- Network to be used - identification of the network needs for a given business data flow.

The detailed core analysis is made in the form of comparison tables which can be found in the section '8.12 Data flows characteristics'.

The following table summarises the findings.

Characteristic	Findings
Capacity	The capacity is linked to the size and the frequency of the data entities to be exchanged. Tables in section '8.12.1 Capacity' present the estimates of the size for a single data exchange and the frequency of these exchanges. They show that: • The highest volume of exchanges is expected for PTI technical data (up to 250 M). • Data exchanges for registration are at medium level. • For the purpose of re-registration, RW Certificate, CoC and Vehicle history can be exchanged together (therefore in total there would be around 5.5 M exchanges for the registration business flow). • Data exchanges for RSI are at the lowest level (around 3 Mio) taking into account that when needed, RSI notifications are considered to be sent together with the RSI report. The volumes for some specific exchanges are negligible due to their very low frequency.
Performance	The performance is linked to the expected response time for each type of message. Tables in section '8.12.2 Performance' present the expected response time for each data exchange. They indicate following: • Short response times are required by only some registration PTI and RSI data flows. • The majority of the data flows have no specific performance requirements.

Characteristic	Findings
Stakeholders	Analysing whether data exchanged between specific stakeholders are bi-directional or not (section '8.12.3 Stakeholders'), the main observations are the following: • The PTI technical data exchange is data retrieval only (one direction) from the vehicle manufacturers to the PTI centres. • The majority of data exchanges related to registration are exchanged between registration authorities. • The majority of data exchanges related to RSI are exchanged between RSI authorities. • There is a set of one directional data exchanges from Member States to EU institutions (reports and statistics). In all the exchanges, the recipient of the request is always known.
Sensitivity of data	The basic pre-condition of data exchange is the need for the authorities to have the right to exchange the information in the first place, as some information may be protected because of intellectual property rights (owned by vehicle manufacturers). In addition, national duties related to freedom of information should be respected. Some of the data exchanges were assessed by Member States as personal data and sensitive data (see also section 3.3.5 'Personal and sensitive data' and section 8.10.2 Data entities. The table in section '8.12.4 Sensitivity of data' analyses whether a flow concerns personal or sensitive data. The tables show that most of the data exchanges don't concern personal data. The strongest data protection measures may therefore be avoided for those data exchanges. Most of the information exchanges are centred on technical data and inspection outcomes. In a system where improving the security of vehicles used throughout the EU is one of the main objectives, a sufficient level of smoothness of information exchange, openness of data and transparency seems desirable over interpreting data protection requirements all too stringently.

Characteristic	Findings
Network to be used	Two networks are considered: • Internet. • Inter-institutional network - currently sTESTA (secured Trans European Services for Telematics between Administrations). This is a trans-European communication infrastructure the objective of which is to exchange electronic data between administrations in Europe in a secure, reliable and efficient way. It is foreseen that both unclassified and classified information can be exchanged through this network. The stakeholder's access to the network and the sensitivity of the data to be exchanged were the two main criteria taken into account for the assessment. The table in section '8.12.5 Network to be used' contains the assessment on the network to be used for each data exchange. In summary the following was found: • Internet has to be used for the communication with vehicle manufacturers as this is the only available network for these stakeholders. • The inter-institutional network is the preferred option for data exchange of personal and sensitive data.

Table 5-1: VIP data flows technical analysis

5.1.2 Conclusions

Taking into account the technical characteristics of the business flows, initial decisions can already be taken. These decisions exclude the options which would be redundant, not needed, not feasible or not worth for the implementation effort due to a very limited use.

5.1.2.1 The exchange of equipment technical data is impractical

This data exchange allows test equipment manufactures to set-up and maintain the test equipment for PTI. It should be noted that among vehicle manufacturers, equipment technical data (defined as per section 4.2.1) has no common format and a wide diversity in terms of documentation. This data has to be provided in a human readable format. Additionally vehicle manufacturers own these data and want to control the access to it. Therefore it is assessed that these data exchanges need to be provided in a similar way to the current RMI websites of vehicle manufacturers. The benefits for the provision of a single communication point for this data exchange were not identified. Therefore, the exchange of equipment technical data for test equipment manufactures via VIP is considered as impractical. In parallel it was found a common catalogue of vehicle manufacturer's available websites could help test equipment manufactures in finding relevant information.

5.1.2.2 One single system for all data exchanges is not a valid option.

During the interviews some MS raised the request to have a single system for all data exchanges (see section 3.3.7). Due to the various natures and technical characteristics (i.e. network usage) of the business data flows it appeared that one single system for all these exchanges is not a valid option. On top of this, a single system would not meet the requirement of re-use of existing systems.

It means that various business flows require different technical solutions, taking into account the specific characteristics of business flows. Three (3) technical data flows were identified:

- VIP-VM: for data exchanges involving vehicle manufacturers.
- VIP-MS (VIP-Member States): for data exchanges between Member States' stakeholders.
- VIP-EU: for data exchanges involving the EU institutions.

The following table provides the main characteristics of these flows.

Technical data flow	Covered data exchange	Characteristics	Comment
VIP-VM	PTI technical data	High volume (size and frequency) of exchanges. Sensitive data (data owned by VM). Data retrieval from VM only. Exchange over Internet only.	Single access point to PTI technical data provided by VM.
VIP-MS	RW Certificate CoC CoC technical data Vehicle End-Of-life Vehicle history Risk rate RSI report RSI notification VIP usage statistics	Medium frequency and small size of data exchanges. Sensitive data. Exchanges between MS authorities only. Preferred use of Inter-institutional network.	For MS authorities to exchange data between themselves. Includes data exchange between VIP-operator and EU institutions
VIP-EU	National RW report (RSI) - overview National RW Report (RSI) - detail	Very low frequency of exchanges. No sensitive data. Exchange between MS and EU institutions only.	Used for the delivery of statistical information and reports to EU institutions.

Table 5-2: VIP technical data flows

The following figure gives an overview of the different technical data flows.

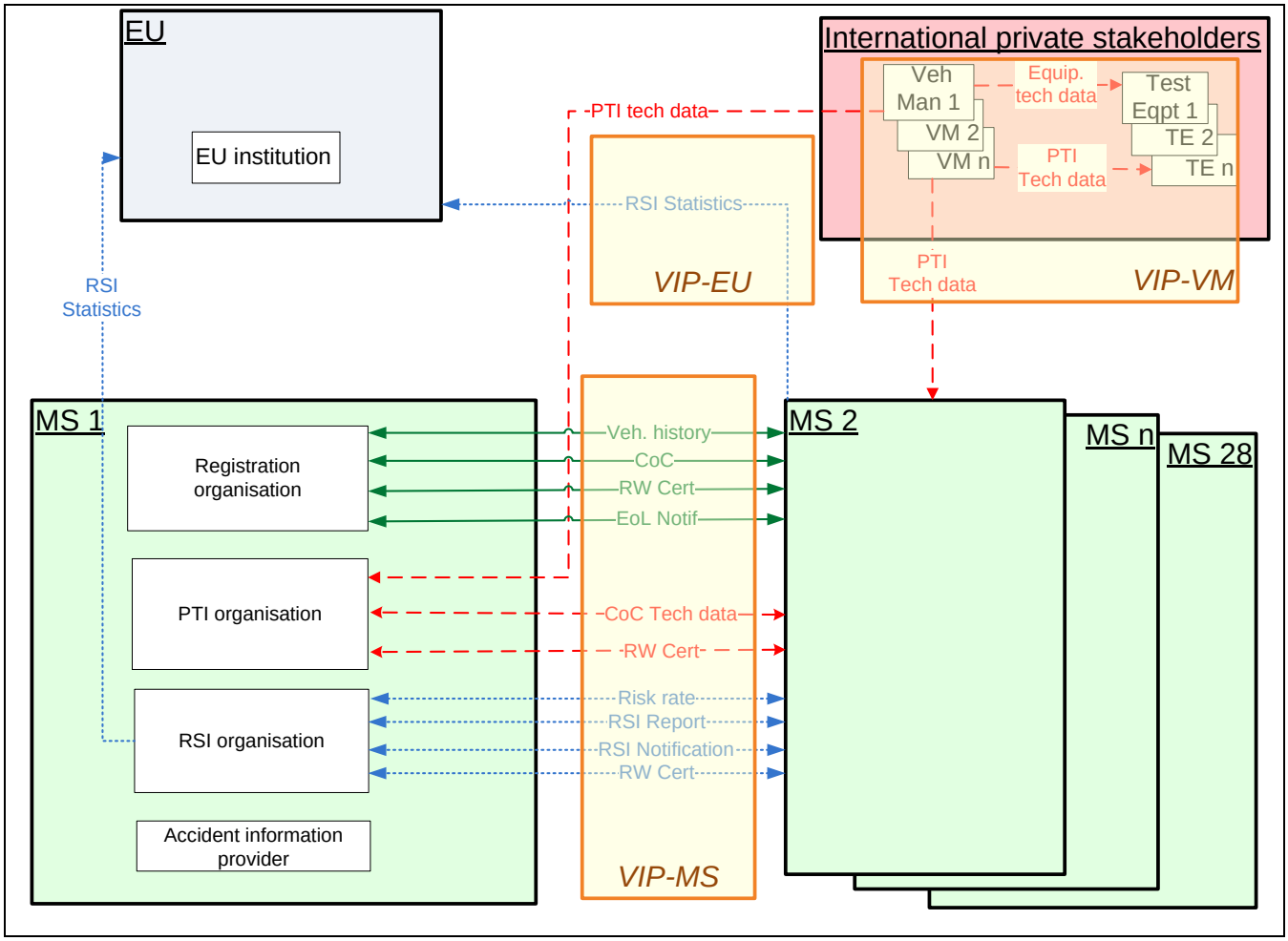

Figure 5-1: VIP technical flows

For clarity reasons, it is to be noted that the VIP usage reports and statistics data flow is not shown on this figure but is taken into account as part of VIP-MS.

5.2 Technical options

The new RW package mentions the re-use of existing IT solutions with regard to international data exchange. On top of this, participating Member States also mentioned re-use as a priority.
For each technical flow identified in the previous section, the technical options analysis was based on the possible re-use of the existing systems. The analysis showed that there was no need to consider implementing a system from scratch.

For each data flow, the possible re-use is analysed and discussed, and relevant costs have been estimated. Because the cost of work hours may change, costs estimates are expressed in workload in terms of person-hours and person-month, taking into account that 1 person-month equals 160 person-hours. The total costs include the maintenance costs estimated for the first 5 years of production.

5.2.1 VIP VM – technical data flow

5.2.1.1 Description

The purpose of this technical flow is the provision of a single access point to PTI technical data provided by vehicle manufacturers. As already mentioned section 4.6 'Initial conclusions related to the business needs for the VIP', the access to the vehicle manufacturer's PTI technical data has to be provided via websites using standardised format and rules.

According to the RW package[3] the detailed rules concerning the data format and the procedures for accessing the relevant technical information shall be adopted in accordance with the principles laid down by Regulation (EC) 715/2007[37] and by Regulation (EC) No 595/2009[62] which oblige manufacturers to provide, at reasonable price, unrestricted and standardised access to vehicle repair and maintenance information to independent operators through websites or, if this is not feasible due to the nature of the information, in another appropriate format. The use of websites is considered as feasible. Vehicle manufactures representatives interviewed in the scope of the current study underlined that currently they do not have other technical means for the provision of such information than through existing repair and maintenance websites.

At the time of writing,

- There is no common standard in use for the access, format and structure of repair and maintenance information (it is planned to be used).
- The ISO norms for standardized access to vehicles repair and maintenance information at websites to be provided by vehicle manufacturers are under development. These standards define a set of preferred electronic data formats (e.g. XML, HTML, PDF) and ensure that data is available as discrete information packages. These standards do not:
  - specify the structure of the information itself,
  - require from manufacturers to change the structure of the technical information they produce,
  - prescribe the way in which such systems should operate.
- A feasibility study on a new performance test for electronic safety components (ESC, ABS, EBS) at roadworthiness tests has been performed in parallel to the current study. It is expected that one of the outputs of the study identify a required set of technical information for roadworthiness testing of the items to be tested and specify recommendations for the test methods.
- Also rules regarding access procedures, data format and structure related to the relevant information to be provided by the vehicle manufacturers still have to be adopted by the EU Commission. They are currently subject to the analysis by a working group set up by the Roadworthiness Committee.

Therefore:

- The access to the information has to be provided through vehicle manufacturer's websites available via Internet.
- Existing RMI websites can be considered to be the re-used.
- It is assessed that only upon completion of the undergoing analysis of the details regarding technical information and rules for roadworthiness testing including data format and data access rules more detailed requirements could be provided for the communication means.
- The implementation of a system to system communication in the scope of VIP-VM is currently not possible

The list below presents identified requirements for the provision of the technical information on the vehicle manufactures websites:

- The data format and data access rules have to be standardised across all vehicle manufacturers (see also recommendations included in section 6.3.1 'Common recommendations for all data exchanges'.
- Designed data format has to be extensible for new tests, new equipment, including multiple versions of tests and equipment, etc.
- The data has to be available in the form of discrete information packages.
- The retrieval of the relevant discrete packages should be based on the provision of the VIN[48] of the vehicle under test. It is possible that some other parameters will be required (which are still to be identified).
- Depending on purpose and use of PTI technical data, two types of data are expected: machine readable and human readable data. Human readable format is needed for the manual part of the test (i.e.: to plug the test equipment into the car). Machine readable format is needed to parameterise the testing equipment and needs to be imported into the tool itself. The data information should clearly specify whether the data is machine or human readable. Human readable information should be available in all official EU languages. Only the version in the relevant language should be returned to the requestor.
- Focus on language independency is important in order to simplify the use of this data and minimise language issues. This can be achieved by the use of codes (which can be translated nationally) in place of textual values.
- Vehicle manufacturers' websites should avoid manual navigation through webpages. All relevant PTI technical data needed for the test should be available immediately after provision of VIN (and possible additional information). Such an approach allows future automation of data retrieval.
- Data retrieval response time should not delay the overall elapsed time of the vehicle test. Namely the time which is spent on other PTI tests which do not require this information can be used for download of the information from vehicle manufacturers.
- As vehicle manufacturers remain owners of this data they have to control the access to the data and provide relevant credentials to users.
- For security reasons credentials for access to vehicle manufacturer's websites should not be stored by the VIP – it should be the responsibility of PTI centres.
- To avoid unauthorised access to the websites use of HTTPS protocol is recommended.
- The retrieval of PTI data could require possible payments. Currently there is no pan-European payment system in place. Therefore it is recommended that processing of payments is left to the responsibility of vehicle manufacturers. The PTI payment scheme could follow current RMI payments scheme.

Taking the above requirements into account, the following design principles are proposed:

- VIP-VM system is a central access point for PTI centres to access vehicle manufacturer's websites providing PTI technical data.
- VIP-VM is a website maintained by EC.
- The VIP-VM website is available in all official languages of the EU.
- It is available via the Internet with the use of a standard web browser.

[48] According to ISO 3779 first 3 digits of VIN contain World Manufacturer Identifier (WMI) denoting the manufacturer of the vehicle and the region in which it was made.

- It contains a database with sufficient information to automatically redirect the PTI user to the relevant website of vehicle manufacturers. Such redirection is based on the VIN of the vehicle under test. The solution has to allow easy updates and maintenance of the redirection links (use cases: create, read, update and delete the redirection link).
- From a PTI centre user point of view the heart of VIP-VM is a central webpage form allowing them to enter the VIN of the vehicle under test and possible other information. This information leads them to the website of relevant vehicle manufacturer (see also section 8.10.5.3 'UC03: Get access to VM's technical data information'). Then the user logs in into the PTI website in order to retrieve relevant PTI technical data immediately.
- For privacy protection reasons the communication protocol for VIP-VM is HTTPS.
- Due to high availability requirements the solution has to be fully redundant and protected against denial-of-service attacks.
- Current approach allows for future implementation of a fully automated solution based on web services with the use of SOAP on HTTPS protocol.

The following figure gives an overview of the VIP-VM system.

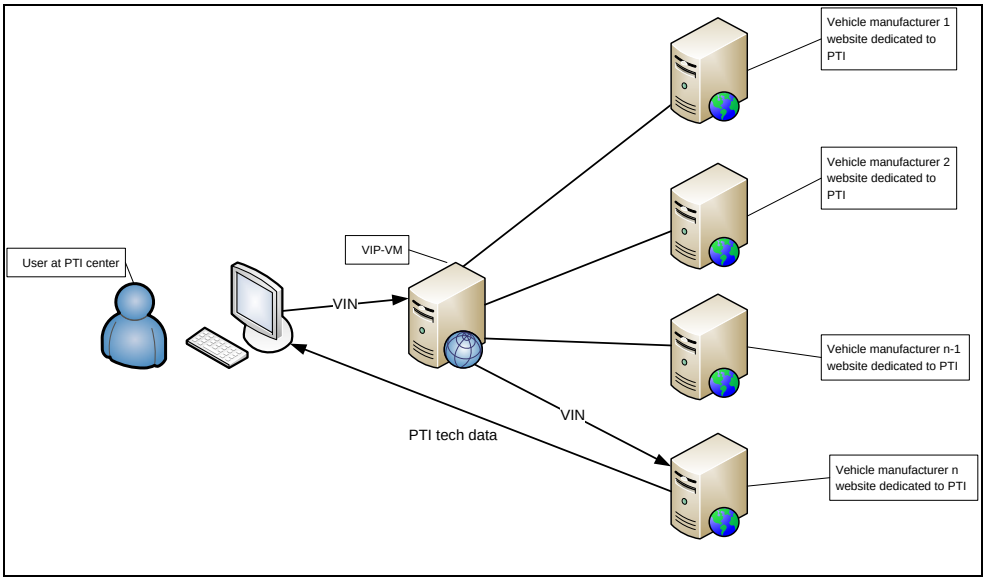

Figure 5-2: VIP-VM system

5.2.1.2 Costs estimates

VIP-VM	# hours-pers.	# pers.-month
Costs for the EU	1,885	11.78

Table 5-3: VIP-VM overall costs estimates

Because of insufficient information on the RMI systems, diversity of implementation among vehicle manufacturers, lack of information concerning the data format and structure as well as data needed, costs for vehicle manufacturers and Member States could not be estimated.

As shown in the table, the costs for the EU institutions of this simple solution are relatively low.

The elapsed time is expected to be 3.5 months for the EU institutions to implement this solution.

5.2.1.3 Discussion

Currently it is unknown whether existing RMI websites could be re-used for this purpose (see section 5.2.1 'VIP VM – technical data flow'.

The exact parameters for the redirection and the standardisation of the data access have to be identified by the Roadworthiness Committee Working Group appointed by the EC. It should also be analysed whether access procedures would require additional specifications towards the VIP-VM.

The implementation guidelines presented previously allow the implementation of a system working under current conditions, lacking standards, specialised testing tools and specialised communication software in PTI centres. Therefore, the following minimal assumptions are taken: PTI centres use a standard web browser and current vehicle manufacturers RMI websites are re-used. These assumptions allow minimising human interaction during the retrieval of the PTI data by the PTI centres. In the future this simple solution can be easily extended allowing full automation (no human interaction) under the condition that standards, testing tools and communication software are already in place at PTI centres. This extension requires the introduction of web services, allowing two systems to communicate with each over the network:

- On the side of the PTI centre, the web browser would be replaced by the testing equipment software able to implement a web service for the communication with VIP-VM and vehicle manufactures website.
- On the VIP-vehicle manufacturer's side, the web service would replace the web page form. In this way the VIP-VM system may receive PTI centre web service request and automatically re-directed it to the relevant vehicle manufacturers' website.
- On the side of vehicle manufacturers' website, upon the reception of the request, the response to the PTI centre request would be provided via web-services.

From the architectural point of view the change of the communication method from web pages to web services requires only the change of the communication interface. All other existing system components remain untouched. This is the reason why such an extension is considered as straightforward.

This solution offers the following advantages and disadvantages:

Advantages	Disadvantages
Simple solution to be implemented by the EC: • Low cost of implementation and maintenance. • Reliability can be easily assured.	PTI authority has no control on the accesses of the PTI centres, unless PTI centres are legally forced to communicate with VM via the national VIP entry point, enabling access control.
Vehicle manufacturers are responsible for the data: • They remain the owners of the data. • They are responsible for the data provision and maintenance. • They control the access to the data. • They collect and control possible payments for the access to the data	It is unknown who will maintain and provide this data in case of vehicle manufacturer bankruptcy.
Possibility to reuse existing RMI websites.	
Extensible – can change together with the evolution of data standardisation, testing tools and software. Allows further automation	

Table 5-4: VIP-VM: advantages and disadvantages

5.2.2 VIP MS – technical data flow

5.2.2.1 Description

The purpose of this technical flow is the exchange of information between Member States' authorities[49].

Currently, 4 systems enable Member States to exchange vehicle information data between themselves: TACHOnet, RESPER, ERRU and EUCARIS. All these systems exchange data over the sTESTA network with the use of XML messages – see also section 3.2.2 'The existing systems'. TACHOnet, RESPER and ERRU share the MOVEHUB platform, including common hardware, COTS and development framework.

EUCARIS provides its own functionalities but this system can also act as a broker[50] allowing Member States to connect to the RESPER and ERRU systems.

[49] Technically it would be possible that the VIP could also be used for the exchange of information within one MS (e.g. between a national registration authority and a PTI authority). Technically this may be possible, but it would require an EU legal basis and there should not be any obstacles prohibiting this exchange in national legislation

[50] Broker: software component which mediates between two systems

From the central site point of view, any system implemented on the MOVEHUB platform could be re-used. From the Member States' point of view, the current connectivity to those systems leads to the following:

- Because only one Member State is directly connected to the RESPER system, this system is excluded from the considerations on the reuse of existing systems for the VIP MS.
- TACHOnet is not further considered because in the majority of the participating Member States, this system is used by another organisation than the registration, PTI or RSI authorities. A number of Member States (e.g. IT, PL, RO) clearly indicated in their answers to the questionnaire that TACHOnet connectivity is implemented and used by other organisations than Registration, PTI and RSI authorities.
- Some Member States have implemented their current physical connection to ERRU via the EUCARIS system. This connection is physically implemented and managed by the Registration authority, which usually is responsible for EUCARIS communication. Additionally it was found that for at least two Member States, the ERRU connection is under the responsibility of RSI authorities. In summary most Member States' connectivity to ERRU is implemented by Registration or RSI authorities.

As a conclusion, the most appropriate systems that can be re-used for the VIP-MS are EUCARIS and ERRU. In the scope of RSI, the re-use of ERRU is part of the functional requirements that were identified. On top of this, most Member States' authorities active in the VIP are already connected to these systems and are currently using them.

The VIP for Member States needs to implement 8 new use-cases[51], which are technically simple message exchanges. A single request is sent to a known addressee, followed by a single response from the addressee to the requestor. Both ERRU and EUCARIS already support such kind of exchanges.

[51] UC01: Get/communicate CoC data, UC02: Notify a vehicle end-of-life, UC06: Get CoC technical data, UC07:Get/communicate RW certificate from/to other MS competent authorities, UC08: Get/communicate (previous) RSI report from/to MS competent authority, UC09: Notify MS competent authority on measures to be taken, UC11: Get/communicate vehicle historical data, UC14: Get/communicate undertaking' s risk rate from/to other MS's RSI authorities

The following table presents the comparison between EUCARIS and ERRU based on some characteristics. Because ERRU architecture is derived from TACHOnet, the latter is also taken into account in the following table in order to show the ERRU's potential and scalability.

	EUCARIS	MOVEHUB platform	
		ERRU	TACHOnet
Owner	MS having signed the EUCARIS Treaty or having acceded to it[52] – some MS do not participate.	EC	EC
Architecture	Peer to peer network for the exchange of XML messages	"Hub and spokes" for the exchange of XML messages	"Hub and spokes" for the exchange of XML messages
Network used	sTESTA	sTESTA	sTESTA
Number of requests per year	Currently: Around 33 M[53, 54]	Currently: around 1.5 M[55]	Currently: around 59M
Number of MS having a technical entry point to the system, or plan so.	25[56] (under various legal basis) It is assumed that all Member States will be connected in the scope of the Prüm Treaty	18 (15 Member State are connected directly, 3 pending Member States are assumed to be connected directly, 10 Member States are connected via EUCARIS) The use of ERRU is mandatory as from 01/2013. MS have the freedom to choose how they are connected - directly or via EUCARIS.	26 Member States + 12 third countries

[52] EUCARIS Rules of Procedure, 1 October 2010
[53] EUCARIS Statistical Report 1-1-2013 / 30-06-2013;
[54] COUNCIL OF THE EUROPEAN UNION- Council Decision 2008/615/JHA of 23 June 2008 on the stepping up of cross border cooperation, particularly in combating terrorism and cross border crime, Council Decision 2008/616/JHA of 23 June 2008 on the implementation of Council Decision 2008/615/JHA of 23 June 2008 on the stepping up of cross-border cooperation, particularly in combating terrorism and cross-border-crime ("Prüm Decisions") - statistics and reports on automated data exchange for 2013
[55] Value extrapolated on the basis of ERRU statistics from April and May 2014.
[56] Figure based on information provided by EUCARIS as for 01/04/2014, see also https://www.eucaris.net/participation.

	EUCARIS	MOVEHUB platform	
		ERRU	TACHOnet
Main institutional user	Registration authorities (For 89% of all MS registration registers are already connected)	Road transport and RSI authorities	Road transport authorities
Supported number of connection points per one MS	Many (but 1 connection point is preferred option)[57]	1 connection point	1 connection point
Logging and monitoring	Because of the architecture, VIP usage statistics has to be retrieved from Member State.	Central monitoring and logging	Central monitoring and logging
Scalability, reliability, resilience and manageability	Architecture provides high scalability 'The best architecture from resilience & manageability perspective. This is because the amount of components is kept to a minimum and there are no single points of failure'[58]	Convenient monitoring due to central logging. Possible synergies with TACHOnet.	8 years of use experience with 38 countries connected (including non-MS), high reliability and low error rate
Costs for Member States	Annual fee covering central development and maintenance, taking into account the Member States usage Implementation and maintenance of connection to EUCARIS	Implementation and maintenance of the connection to ERRU	Not applicable – reuse of TACHOnet is not considered

[57] EUCARIS can deal with a series of organisations within a MS, each with their own EUCARIS interface. This is currently the case in France, Luxembourg and Finland. It is possible to configure the system that some services can be dedicated for one organization where other services for another organization, user groups can be completely segregated, so a user of service A can never see information related to service B.

[58] GARTNER: A Report for Directorate General Transport and Energy: Eucaris Resper Evaluation Study - Architecture Evaluation Report January 2008 — Version 1.1

	EUCARIS	MOVEHUB platform	
		ERRU	TACHOnet
Costs for the EC	No costs	Implementation and maintenance of ERRU	Not applicable – reuse of TACHOnet is not considered

Table 5-5: VIP-VM: systems re-use characteristics

Based on the previous, the following table considers the re-use of both systems for the data entities that need to be exchanged by the VIP-MS:

Data entity	Reuse of ERRU	Reuse of EUCARIS	Comments
RW Certificate	+	+	This data entity is exchanged between all authorities.
CoC	+	++	These exchanges occur mainly between MS registration authorities. Therefore EUCARIS, which is widely used by MS registration authorities (89%)[59], is a very good candidate for the reuse in this scope.
CoC technical data	+	++	
Vehicle history	+	++	
End-of-life notification	+	++	
Risk rate	++	+	These exchanges occur only between MS RSI authorities. Some of RSI authorities are already connected to ERRU. There is already a legal recommendation to reuse ERRU (*NF03: Re-use of ERRU for RSI notifications and RSI reports*). No reason was found in order to reject this recommendation, not to implement a new system for this purpose.
RSI report	++	+	
RSI notification	++	+	
VIP usage statistics	++	-	Currently, EUCARIS usage statistics are retrieved from MS. It appears that the monitoring lacks sufficient thoroughness which may lead to undetected issues and problems. This should be improved even in the case EUCARIS is not reused for VIP.

Table 5-6: Reuse options for VIP-MS

It appears that both systems would fit the VIP needs, with ERRU fitting better to the RSI flows, and EUCARIS better fit for registration and PTI needs.

[59] Figure based on information provided by EUCARIS.

In that scope, three options are identified. From the Member States side, the options have an impact on their actual connectivity to those systems:

- Option 1: EUCARIS only
- Option 2: ERRU only
- Option 3: ERRU with EUCARIS connectivity
- Option 4: Create a new system by re-using the MOVEHUB framework for its development

Each option is further explained and illustrated below with the following legend:

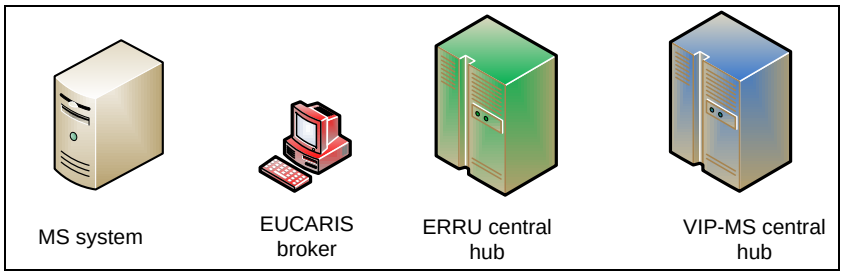

Figure 5-3 Legend for VIP-MS system diagrams

Option 1: EUCARIS only

All VIP-MS exchanges are implemented in EUCARIS only.
This option assumes that all Member States are connected to EUCARIS in the scope of the Prüm Treaty, so that each Member State may re-use its current connection to EUCARIS. The following figure provides an overview of the architecture.

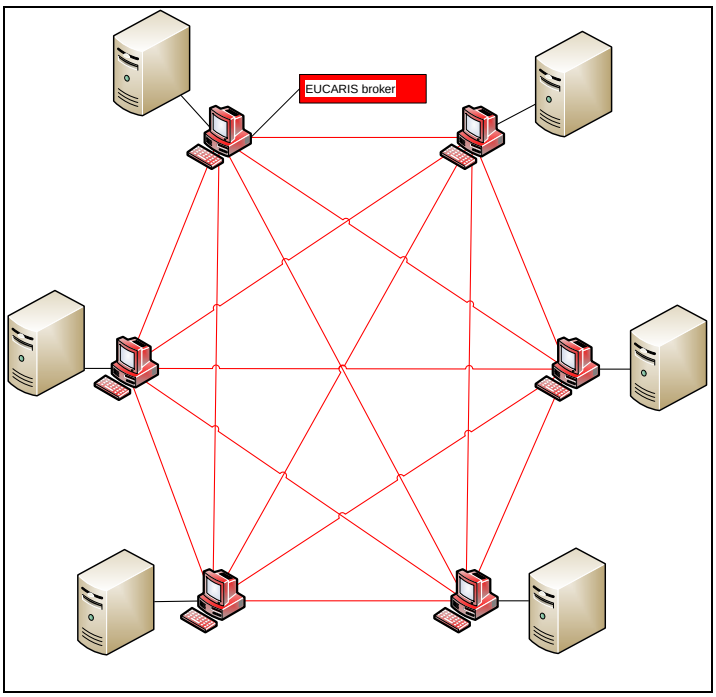

Figure 5-4 VIP-MS system - Option 1

Option 2: ERRU only

All VIP exchanges are implemented in ERRU only.

This option requires that all Member States are directly connected to ERRU. Because ERRU doesn't allow more than one connection per Member State, Member States currently accessing ERRU through EUCARIS will have to stop using that connection and implement a direct connection to ERRU in order to communicate in the scope of the VIP. The current functionalities that Member States use in the scope of ERRU will need to be updated to use the new connection as well. This concerns ten (10) Member States.
Member States that are not connected to ERRU yet are considered to be connected to ERRU directly as they will have to implement a new connection as per legal obligation.
The following figure provides an overview of the architecture.

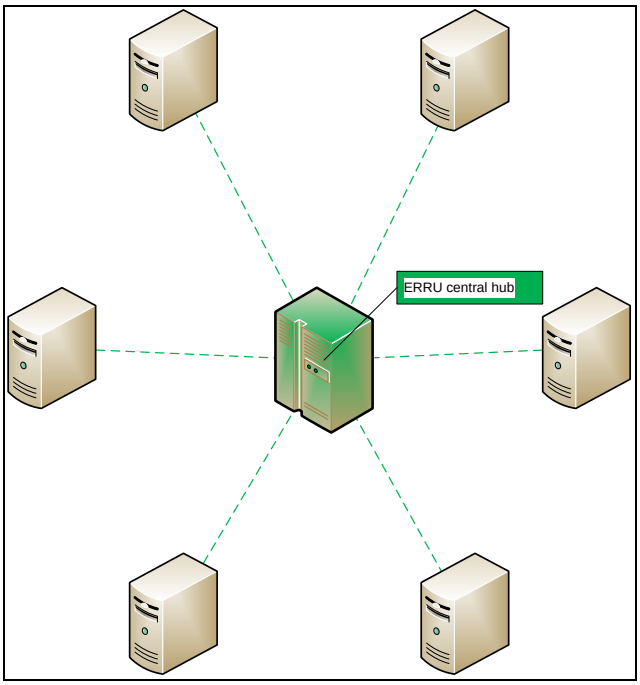

Figure 5-5 VIP-MS system - Option 2

Option 3: ERRU with EUCARIS connectivity

All VIP exchanges are implemented in ERRU and the connectivity with EUCARIS is maintained. This option gives the Member States the full choice of connectivity. The following figure provides an overview of the architecture.

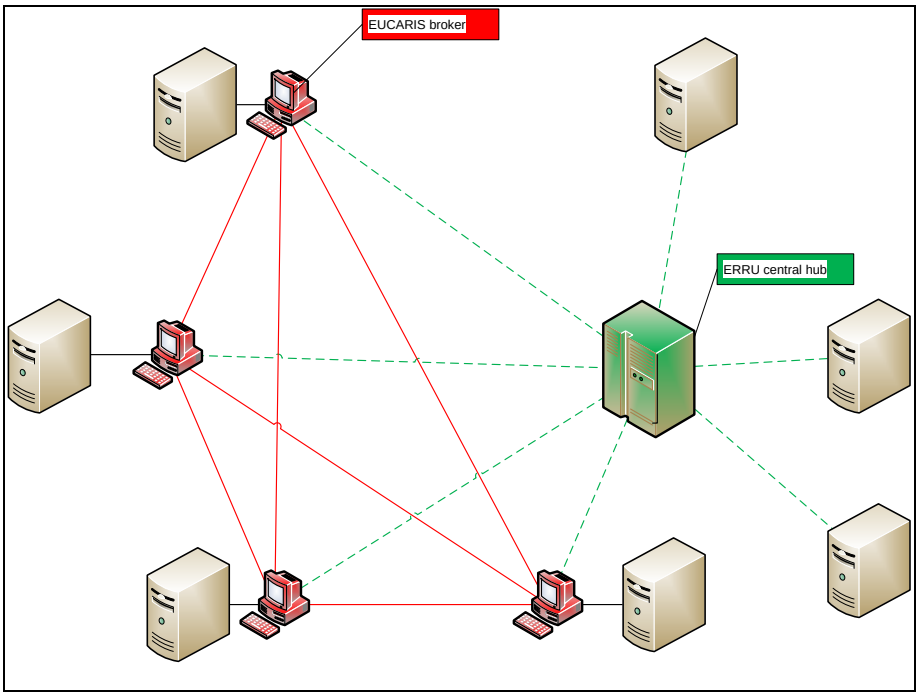

Figure 5-6 VIP-MS system - Option 3

Option 4: New system

All VIP exchanges are implemented in a new system called VIP-MS. The development of the new system re-uses the MOVEHUB shared platform and its framework, meaning that the architecture will be the same as the one of the existing RESPER/ERRU/TACHOnet systems. Similarly the connection between the Member States and central hub will be implemented in the same way it is done for each of these 3 systems.
This option requires that all Member States implement a new connection to the new VIP-MS. The following figure provides an overview of the architecture.

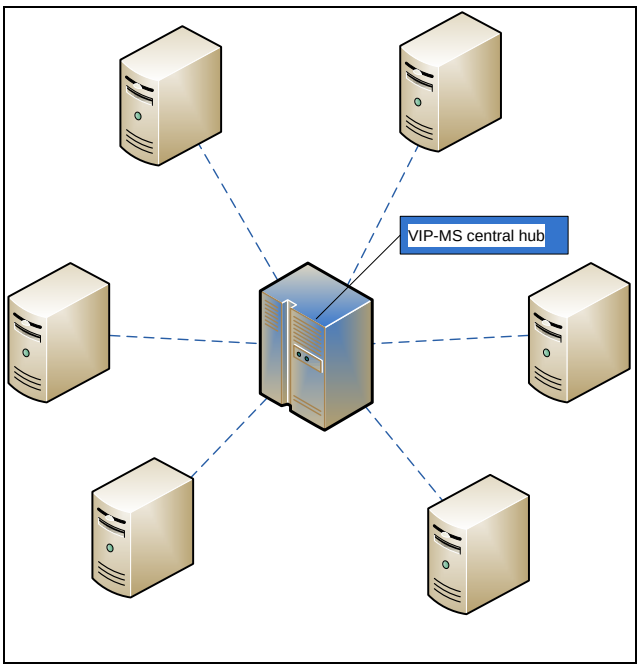

Figure 5-7 VIP-MS system - Option 4

5.2.2.2 Cost estimates

Detailed information on the cost estimates for each option may be found in annex 8.14.2 'VIP-MS Cost estimates'.

Cost estimates for the 4 options have been split between the central system and the Member States.

The following table provides an overview of the total implementation costs for each option, taking into account the central development al the development for all 28 Member States.

VIP-MS	Costs for central development and maintenance		Total costs for Member States (28 MS)		VIP-MS Overall costs	
	# hours-pers.	# pers.-month	# hours-pers.	# pers.-month	# hours-pers.	# pers.-month
VIP-MS option 1 (EUCARIS only)	9,711	60.7	228,564	1,429	238,275	1,489
VIP-MS option 2 (ERRU only)	8,630	53.9	257,964	1,612	266,594	1,666
VIP-MS option 3 (ERRU + EUCARIS)	19,834	124.0	228,564	1,429	248,398	1,552
VIP-MS option 4 (new system)	10,996	68.7	242,732	1,517	253,728	1,586

Table 5-7: Cost estimates for VIP-MS

Considering the central development and maintenance, implementing VIP-MS functionalities re-using ERRU (option 2) is the most cost-effective option because of the lower impact on the updates of the current system. Option 3 is the most expensive because both ERRU and EUCARIS systems need to be updated.
The costs related to the implementation of a new VIP-MS system (option 4) are minimised because the existing MOVEHUB framework and development methods are re-used.

Considering total implementation costs for all Member States, options 1 and 3 are equivalent because the current Member States' connection to EUCARIS or ERRU is reused. It is therefore assumed that Member States will implement the new use-cases on top of the system they currently use to communicate with ERRU.
Option 2 is the most expensive because ten (10) Member States will have to implement a new direct connection to ERRU, impacting the existing integration with that system. In addition to the implementation of the new use-cases, this involves dropping the existing connection to ERRU made via EUCARIS, implementing a direct connection to ERRU, and updating the existing use-cases that use ERRU.
The implementation of option 4 (new VIP-MS) is be facilitated by the current experience of connectivity and testing methods with the current systems implemented on the MOVEHUB.

Considering the overall implementation costs, including the costs for the central implementation and the costs for the Member States, option 1 is the most effective while options 3 and 4 are equivalent. Option 2 is the most expensive, due the impact of the connection updates on Member State side.

It is to be noted that these costs don't take into account the fact that EUCARIS and ERRU are currently managed and funded by different stakeholders, respectively EUCARIS and the EC.
Currently the funding of EUCARIS is based on Member States fees. In order to cover development and maintenance of the VIP-MS on EUCARIS, those fees will probably be adapted. Because these costs are already taken into account for the central development and maintenance estimates of the VIP-MS, the direct impact of the fee increase is not taken into account for Member States estimates.
In any case, costs for the implementation of ERRU will be covered by the EC. ERRU is financed by the EC budget.

5.2.2.3 Discussion

Legal governance framework
The main and predominant aim of the selected functionalities for the Vehicle Information Platform is improving road safety. If EUCARIS is used for the exchange of vehicle information, data flows that are related to the police cooperation framework and currently implemented in EUCARIS should be technically separated from the Road Safety information exchanges. The current EUCARIS architecture allows and achieves such separation of data flows related to various legal frameworks.
Any legal governance framework detailing the governance of the use of EUCARIS or ERRU would need to be based on article 91 of the Treaty on the Functioning of the European Union.

Responsibilities of the EU institutions in the VIP
As described in section 4.8, the EU institutions are responsible for facilitating the vehicle information exchange between the Member States. Beside the management of the EU network, this responsibility also includes the management of the VIP. Because EUCARIS is not owned by the EU institutions, this latter requirement is not met. This could be solved through setting up strong governance and decision making processes between the EU institutions and the current owner of EUCARIS. Although the option of using EUCARIS only seems attractive by its cost effectiveness, the ownership of the system represents a major issue for the EU institutions.

Additional traffic capacity
Referring to annex 8.12.1, the yearly flow for the VIP-MS system is estimated to 10.5 Million messages/year based on the following:

- Registration: 4.5 Million messages/year
- RSI: 6 Million messages/year
- PTI: currently, the legislation requires PTI to be performed in the Member States of registration. This flow has not been taken into account.

Current performance tests for both ERRU and EUCARIS ensure traffic capacity up to 41 Million messages/year[60]. The additional estimated traffic linked to the VIP-MS system would not impact the performance of ERRU, while the limit of EUCARIS would be reached. Additional tests should be performed in order to confirm EUCARIS performance. In case the system would not be able to support the additional traffic with correct performance, an infrastructure upgrade would be needed. At the time of writing, these tests are not performed yet and eventual needs not identified. Therefore this potential upgrade has not been taken into account in the costs estimates.

[60] Each MS currently connecting to ERRU (directly or via EUCARIS) has to pass performance tests proving that 6 messages per second can be processed (source is section 2 2 of document 'MOVEHUB Guidelines for the Member State Tests V1 20'). Sending 6 messages per second in an 8 hours window for each working day in the year provides a total of 41 M messages per year (6*3600*8*20*12 = 41 Million).

Logging and Monitoring

During the analysis of the EUCARIS statistical usage reports, it appeared that a high error rate (up to 2% of exchanges) is observed for some Member States. Some statistics are incomplete as well, showing in total around 5% less responses than the total number of requests.

Initially, the following causes were identified:

- there are missing reports from some MS,
- there are issues with national registers,
- some responses are wrongly correlated with the requests,
- some responses do not reach the country of destination.

This leads to the conclusion that the system monitoring lacks sufficient thoroughness which can lead to undetected issues and problems.

Implementation schedule

The implementation of the VIP on a single system (options 1, 2 and 4) would last 15 months. The implementation of the VIP on both systems (option 3) would last 22 months. Because of the increased complexity of the system, the main impact lays on the testing phase related to the integration of both systems. Additional integration tests between these systems have to be taken into account.

5.2.3 VIP EU – technical data flow

5.2.3.1 Description

The main objective of the VIP EU technical data flow is the delivery of statistical information and reports to the EU institutions. One (1) data entity is identified for this exchange: RSI national statistics.
This data exchange is related to the following use-case: 'UC10: Send national RSI statistics to EU institutions'.

Due to low frequency of this exchange it seems that the implementation of a dedicated communication channel could be hardly justified economically. Therefore two options are considered for the exchange of national RSI statistics.

A centralised database is required to store the data submitted by Member State prior to extracting consolidated reports.

Option A: Re-use of CIRCABC

National RSI statistics (both overview and detailed report) may be delivered via CIRCABC (see '3.2.2.1.4 CIRCABC') with the use of a predefined format and structure for the data to be exchanged (e.g. XML or plain spreadsheets).

Option B: Extend VIP-MS with VIP-EU.

This option considers the extension of VIP-MS for the delivery of RSI national reports. A central data storage is required in order to perform proper follow-up and further data consolidation for the EU institution's needs.
This approach requires the implementation of following additional use case in VIP-MS:

- UC10: Send national RSI statistics to EU institutions

Depending on the option chosen for VIP-MS, several possibilities are taken into account and summarised in the following table:

VIP-EU options B	Description
Option B1	Extend VIP-MS option 1, EUCARIS only
Option B2	Extend VIP-MS option 2, ERRU only
Option B3	Extend VIP-MS option 3, EUCARIS and ERRU
Option B4	Extend VIP-MS option 4, new VIP-MS

Further cost estimates and discussions of these options assume that VIP-MS is totally implemented already.

Cost estimates

Detailed information on the cost estimates may be found in annex 8.14.3 'VIP-EU Cost estimates'.

Cost estimates for each option have been calculated towards the central implementation and towards the Member States. Cost estimates towards central implementation assume that VIP-MS has central logging implemented. Therefore, as a pre-requisite, the possible re-use of EUCARIS assumes that central logging is present.

The following table provides an overview of the estimated costs for all Options of VIP-EU system.

VIP-EU	Total costs for central development and maintenance		Total costs for Member States (28 MS)		VIP-EU Overall costs	
	# hours-pers.	# pers.-month	# hours-pers.	# pers.-month	# hours-pers.	# pers.-month
VIP-EU option A (re-use CIRCABC)			14,252	89	14,252	89
VIP-EU option B1 (re-use VIP-MS EUC only)	514	3.2	14,252	89	14,766	92
VIP-EU option B2 (re-use VIP-MS ERRU only)	514	3.2	14,252	89	14,766	92
VIP-EU option B3 (re-use VIP-MS EUC + ERRU)	1.028	6.4	14,252	89	15,280	95
VIP-EU Option B4 (re-use new VIP-MS)	514	3.2	14,252	89	14,766	92

Table 5-8: VIP-EU overall costs estimates

From Member State side, the costs are the same as each Member State will have to implement one (1) new use-case in order to provide and send the RSI national statistics to the EU institutions.

From central system side, the table shows that the most cost effective solution is option A - re-use of CIRCABC.

The costs related to the extension of VIP-MS depend on the option chosen for VIP-MS. Extending a single system for VIP-EU (EUCARIS (option B1), ERRU (option B2) or new VIP-MS (option B4)) lead to the same costs as only one system is to be updated. Option B3 is the most expensive because two (2) systems need to be updated.

The expected elapsed time is estimated to 2 to 3.5 months depending on the option chosen.

5.2.3.2 Discussion

Based on the description provided above, the following compares both options

	Option A Re-use CIRCA-BC	Option B Extend VIP-MS
Data validation	Manual validation based on file description and validation rules (xsd files).	- Fully automatic data validation
Legal basis	N/A	Part of the RW package.
Data storage	Central repository.	- Requires central storage of data received for consolidation purposes: ERRU is compliant, EUCARIS is not.
Data submission follow-up	Manual	- Fully automated workflow with automatic notifications to Member States.
Infrastructure	Re-use of existing infrastructure.	- Extend/use VIP-Member State infrastructure. - In case options B1 is chosen (EUCARIS only), a centralised database needs to be set up to collect statistical data submitted.
Implementation effort for MS	Reports sent manually	Reports sent automatically.
Implementation effort at central side	Most cost effective	Extending VIP-MS with only 1 system (Options B1, B2 and B4) is most cost effective than extending hybrid system
Schedule	Existing systems are in place. The implementation roadmap may be started at any time	The VIP-EU can be taken into account as for the beginning of the implementation of VIP-MS.

Both options for VIP-EU would need to set-up standardised data format and structure to be used for all types of reports.

5.3 Conclusions

Considering the re-use of existing systems for each technical flow, the following shows the identified possibilities and their implementation costs.

Technical flow	System to be re-used	Total costs	
		# hours-pers.	# pers.-months
VIP VM	Existing RMI websites of vehicle manufacturers for the exchange of PTI technical data and technical equipment data. It is to be noted that the costs for VIP-VM only concern the costs at EU level (see previous sections for more details).	1,885	12
VIP MS	Four options have been identified: Option 1: All exchanges to be implemented in EUCARIS only. Option 2: All exchanges to be implemented in ERRU only Option 3: All exchanges to be implemented in ERRU and EUCARIS Option 4: all exchanges to be implemented on a new system	 238,275 266,594 248,398 253,278	 1,489 1,666 1,552 1,586
VIP EU	Option A: CIRCABC for the delivery of RSI national reports. Option B1: extend VIP-MS Option 1 Option B2: extend VIP-MS Option 2 Option B3: extend VIP-MS Option 3 Option B4: Extend VIP-MS Option 4	14,252 14,766 14,766 15,280 14,766	89 92 93 95 92

Table 5-9: VIP systems overview

Taking into account the costs of each system, it appears that for the EU institutions, the development and maintenance costs of VIP-VM system is low. The overall effort for Member States and vehicle manufacturers are not known.

The main effort for the implementation of the VIP is linked to the implementation of the VIP-MS system. The total effort of the VIP-EU extending VIP-MS for all Member States and central implementation is about 5% of the effort for VIP-MS.

As a final and global overview of the overall implementation costs for the VIP, the following table provides an overview of the total VIP implementation costs including 5 years of maintenance. Each option takes into account the costs of the VIP-EU and the VIP-MS related option. All costs include the costs related to the VIP-VM.

VIP-MS	Total costs for VIP			
	VIP-EU option A (re-use CIRCABC)		VIP-EU option B (extend VIP-MS)	
	# hours-person	# persons-month	# hours-person	# persons-month
Option 1 (VIP-VM + VIP-MS re-using EUCARIS only)	254,254	1,590	254,926	1,593
Option 2 (VIP-VM + VIP-MS re-using ERRU only)	282,731	1,767	283,245	1,770
Option 3 (VIP-VM + VIP Member State re-using ERRU and EUCARIS)	264,535	1,653	265,563	1,660
Option 4 (VIP-VM + new VIP-MS)	269,865	1,687	270,893	1,693

Table 5-10: Overall costs for the VIP

The overall costs, covering the development and maintenance workload of all systems and the implementation in all 28 Member States would vary between 1,590 person-months and 1,770 person months, depending on the option chosen for both VIP-EU and VIP-MS systems. The two extremes are VIP-MS using EUCARIS only and VIP-EU re-using CIRCABC at the lowest end, and VIP-EU extending VIP-MS using ERRU and EUCARIS at the highest end.

6 Recommendations

6.1 Legal Framework

The following general guidelines based on the legal requirements described in section 4.4 'Legal requirements' will support the legality of VIP system developments and use.

The VIP system may not be used for law enforcement purposes. It can be used for administrative cooperation in areas listed in the Roadworthiness Package and other legislation concerning the vehicle information exchange throughout the EU. The main purpose of a seamless flow of vehicle information is improving road safety and environmental protection related to vehicles throughout the EU. This also includes the exchange of vehicle equipment technical information with vehicle manufacturers and test equipment providers.
The Roadworthiness Package requires competent authorities to exchange information to establish the safety of a vehicle and its adherence to environmental standards. In line with data protection principles, the name of the officer or inspector who has carried out the inspection, the VIN number and the license plate number should only be requested when (i) it is authorised under the relevant legislation and (ii) it is necessary for a decision in the case. In practice, it should in many instances be possible to make an informed decision and answer the question(s) asked through VIP without referring specifically to personal data concerning an individual or other sensitive data such as the VIN or the license plate number. However, where in a particular case there is genuine need to exchange information of this kind, VIP may and should be used for this purpose in accordance with the Roadworthiness Legislation.

Where the name of the officer or inspector who has carried out the inspection is processed in the VIP system on the basis of specific provisions of EU Roadworthiness Legislation, it is not necessary to ask for their consent in order to justify the processing.

When personal data such as the driver's name is collected directly from an individual (e.g. via a form), they should be provided with at least the following information:

- the fact that their personal data may be processed internationally in VIP systems;
- the right to access their personal data and to have it corrected.

All VIP system stakeholders (i.e. the vehicle information competent authorities, private stakeholders) are jointly responsible for ensuring adequate transparency towards data subjects and share responsibility for ensuring security of VIP exchanges and its operations. This requires an analysis of the risks and the definition and integration of appropriate technical and organisational security measures in the VIP system. For example, authentication (a PIN/password combination) and access control mechanisms to ensure the confidentiality and integrity of the VIP system.

In addition, each competent authority is a data controller and is therefore responsible for ensuring the security of personal data it handles. Consequently, each VIP user must implement organizational security measures applicable to the processing of personal data in accordance with national legislation. In general, security measures for VIP users must not be different from those measures their authority applies to other IT tools used for personal data processing. For sensitive data, basic precautions which should be taken include: keeping the password and security code safe, and (for those involved in user

management) making sure that VIP user lists are kept up to date, and that access rights of those users are well managed.

Vehicle manufacturers bear a responsibility to public safety to provide the necessary level of technical data on electronic equipment needed. At the same time, testing tool providers and owners of vehicle information (such as vehicle manufacturers or private authorities) who have invested in the development and protection of trade secrets, copyright or patent protections or rights related to the legal protection of databases may have sought to protect this information from competitors by instituting special procedures for handling it, as well as by non-disclosure agreements or technological and legal security measures. Unless deemed unlawful, such provisions and measures shall be respected by the authorities exchanging information via the VIP.

Effective liability arrangements, accountability mechanisms and redress measures should, in the first place, be ensured by national judiciaries adjudicating over the activities of the VIP competent authorities and other stakeholders.

A smooth exchange of data requires a common development and understanding of rules. A VIP legal working group can be established among the VIP competent authorities to establish and clarify common working rules and legislative interpretations related to vehicle information data exchange.

Strengthening the legal framework:

To further improve the exchange of vehicle information throughout the EU, it is recommended to develop a sound EU legal basis to:

- Create a common EU Governance Framework for the VIP systems shared by all EU MS and private stakeholders.
- Clarify the rules for vehicle data usage at EU level. This should entail:
  - Further integration of vehicle information statistics in the European Statistical System.
  - A mechanism ensuring EU solidarity and compensation for vehicle information ownership rights and the further development and maintenance of vehicle information.
  - An EU framework to determine which vehicle data should be open and publically accessible throughout the EU.

6.2 The most appropriate architecture for the VIP

The main question of the study is the following: 'What is the most appropriate architecture for the VIP?' The answer is that there is no single platform which can be recommended for all data exchanges due to different natures and requirements for these exchanges. For each technical flow identified, the use of a separate platform is recommended:

VIP-VM – is the part of the system used for the retrieval of PTI technical data from vehicle manufacturers. As already described in section 5.2.1, only one feasible solution was identified: a website serving as a single connection point to PTI technical data provided by vehicle manufacturers. This is determined by the current state of play and existing legislation which requires the following:

- PTI technical data is owned and maintained by vehicle manufactures – it means that this data cannot be replicated on other systems.

- Access to the data has to be maintained by vehicle manufacturers due to data ownership and access rules, including the possible payment that is linked to it.
- According to the RW Package this data has to be available via vehicle manufacturer's websites accessible from the Internet.

VIP-MS – is the part of the system dedicated to the exchange of vehicle related information between Member States authorities (registration, PTI and RSI). Due to the strong requirement on the re-use of existing systems, two candidate systems were identified: ERRU and EUCARIS. The architectures of these systems differ. The first one is a messaging system acting as a secure and reliable "hub & spoke" system where the latter system has distributed peer to peer architecture. Both candidates were assessed to suit and meet the requirements of the future platform (for example there are no specific needs for a central component as all exchanges always occur between two Member States).

Taking the above into account four options were identified for the implementation of VIP-MS (see section 5.2.2):

- Option 1: All use-cases are implemented in EUCARIS only.
- Option 2: All use-cases to be implemented in ERRU only.
- Option 3: All use-cases are implemented in ERRU and connectivity with EUCARIS is maintained.
- Option 4: New system implementing VIP-MS

The following table provides a qualitative comparison between the identified options. The notation used is the following:

- '++' : high advantage
- '+' : advantage
- '-' : disadvantage
- '--' : high disadvantage

	Option				Comment
	1	2	3	4	
Functionality	+	+	+	+	All functional needs are met by all options
Reliability	-	+	-	+	Options 1 and 3 re-use EUCARIS for which it was identified that logging and monitoring need improvement in order to track potential issues. The complexity of the hybrid Option 3 lowers the reliability assessment.
Availability	++	+	-	+	Peer-to-peer architecture (Option 1) guarantees higher availability due to the distributed system components and absence of single point of failure. The complexity of the hybrid Option (3) is a disadvantage to the availability.
Performance	+	+	+	+	No relevant differences found.
Scalability	++	+	+	+	Peer-to-peer architecture (Option 1) is the most scalable option for one to one message exchanges.
Security	+	+	+	+	No relevant differences found.
Infrastructure	-	++	-	++	Because EUCARIS would reach the proven limit of its current throughput, additional performance tests could prove that infrastructure would need to be upgraded.

	Option				Comment
	1	2	3	4	
Manageability and testability	+	++	-	++	A hybrid solution requires specific testing for MS integrating in a different way than the standard one. Testing of peer-to-peer architecture (Option 1) is more complex than for the "hub and spokes" architecture (Options 2 and 4).
Governance	--	+	-	+	Because EUCARIS is not owned by the EC, all architectures using EUCARIS are assessed as being disadvantages due to identified governance issues.
Schedule	-	+	--	+	The complexity of a hybrid solution requires longer duration of the project, mainly for testing reasons.
Member States' Connectivity	++	-	++	+	Option 2 requires that 10 Member State modify their connectivity to ERRU. Option 4 requires the development of a new connection to the system for all Member States.
Maintenance	+	+	-	+	The complexity of the maintenance of hybrid systems (Option 3) is a disadvantage.
Operational monitoring	-	++	--	++	Operational monitoring for Option 1 is decentralised in each Member State, which is a disadvantage for day-to-day follow-up.
Usage and statistical reports	-	++	--	++	Usage and statistical reports for Option 1 relies on all Member States systems
Costs for the Central development	+	++	--	-	The Central development for Option 2 is the most cost effective.
Costs for Member States	++	-	++	+	Option 2 requires higher effort on Member States' side because 10 Member State have to change their connectivity to ERRU..
Total costs	++	--	+	-	Sorting the options in ascending order of their total costs gives the following sequence: - Option 1, - Option 3, - Option 4 - Option 2 (highest total cost).
Total balance	**9+**	**15+**	**5-**	**17+**	**This summary presents balance between the total number of '+' and '-' for each option.**

Table 6-1: VIP-MS: Qualitative comparison between the options for VIP-MS

Taking into account the advantages and disadvantages of each option for each criteria, the balance shows that

- Option 3, re-using ERRU and EUCARIS has the most disadvantages for implementing VIP-MS
- Option 1, re-using EUCARIS only is attractive but faces a main issue regarding the ownership and governance of the system.
- Option 4, implementing a new VIP-MS has the most advantages.
- Option 2, re-using ERRU only is similar to implementing a new system but has a negative impact on Member States' connectivity.

The implementation of VIP-MS on the existing platform (MOVEHUB) owned by the EC is the best suited option. Depending on the current organisation and management of the MOVEHUB platform and the impact on Member State, Options 2 and 4 are best suited.

VIP-EU - is part of the VIP system responsible for the delivery of RSI national statistics towards the EU institutions. Two options were considered

- Option A re-using the CIRCABC system based on standardised formats (see full description in section 5.2.3).
- Option B considering the extension of VIP-MS. Depending on the option chosen for VIP-MS, costs and implementation impact vary from central implementation side:
  - Option B1 re-uses VIP-MS option 1, based on EUCARIS only
  - Option B2 re-uses VIP-MS option 2, based on ERRU only
  - Option B3 re-uses VIP -MS option 3, based on both ERRU and EUCARIS.
  - Option B4 re-uses VIP-MS option 4, based a new system.

The following table provides a qualitative comparison between the identified options. The notation used is the following:

- '++' : high advantage
- '+' : advantage
- '-' : disadvantage
- '--' : high disadvantage

	Option					Comment
	A	**B1**	**B2**	**B3**	**B4**	
Functionality	-	+	+	+	+	Option A doesn't support automation processes
Central data storage	+	-	+	+	+	EUCARIS (options B1) doesn't provide central database storage.
Data consolidation	-	-	+	+	+	EUCARIS doesn't provide easy data consolidation because of missing centralised data storage. CIRCABC (option A) requires manual data consolidation.
Automatic validation	- -	+	+	+	+	CIRCABC doesn't provide automatic validation
Automated submission follow-up	-	+	+	+	+	CIRCABC doesn't provide automatic submission follow-up.
Governance	+	- -	++	-	++	Because EUCARIS (options B1 and B3) is not owned by the EC, all architectures using EUCARIS are assessed as being disadvantaged due to identified governance issues
Costs for the Central development	+ +	+	+	-	+	Central development costs for Option A are the most cost effective. Option B3 is less cost effective because of being a hybrid solution
Costs for Member States	+	+	+	+	+	All Member States have to implement the same use-case, independently from the option chosen.
Total costs	++	+	+	-	+	Option B3 is the least cost effective because of the hybrid solution.
Total balance	**2 +**	**2+**	**10+**	**3+**	**10+**	**This summary presents balance between the total number of '+' and '-' for each option.**

Table 6-2: VIP-EU: Qualitative comparison between the options

Taking into account the advantages and disadvantages of each option for each criteria, the balance shows that

- Options A, B1 and B3 have the lowest number of advantages for implementing VIP-EU, mainly because of the absence of automation or central data storage possibilities. Options B1 and B3 have additional disadvantages related to governance issues.
- Options B2 and B4 are equal and are the most advantageous ones, mainly because they are owned by the EC and provide central data storage together with automation.

Taking into account the low differences in the costs, it is recommended that VIP-EU extends VIP-MS. Because only one (1) use-case has to be implemented, it is recommended that this functionality is taken into account from the start of the implementation project in order to have a global approach and minimise the costs related to the implementation of that single use-case.

As a conclusion, the overall VIP system would consist in two parts:

- One system for the communication with the vehicle manufacturers, namely called VIP-VM
- One system for the communication involving national authorities and EU institutions covering all data exchanges related to registration, PTI and RSI, namely called VIP-MS.

6.3 Implementation recommendation

The current section presents the technical recommendations, implementation guidelines, impact, benefits and remaining open issues to be handled at a later stage. After describing common recommendations for all data exchanges, specific recommendations are provided for each technical option.

6.3.1 Common recommendations for all data exchanges

One of main requirements raised by Member States concerns the establishment of common data structure and format for data exchanges. The analysis of the data entities and business processes also shows this need. Therefore common data formats are needed for all data entities identified in order to ensure coherence and quality.

6.3.1.1 Common rules for data format

The following provides recommendations applicable to all data entities to be exchanged between stakeholders:

- Set-up a data dictionary, defining all business data in terms of data types, data formats and structures. A detailed description of the data entities that can be found in the section '8.10.2 Data entities' may be used as input.
- Ensure that data items used in several data entities use the same data type. e.g. ensure that the VIN has the same type in all relevant data entities.
- Keep the same data structure for the main elements of all data entities (e.g. the same header structure, use mandatory fields in alphabetical order/order of importance, keep optional elements at the end of the list). It will facilitate the development and testing of the solution.
- Use code tables when possible – numerical values assigned to specific meaning, e.g. colours. Code tables are used to allow data to be entered into the system in a unified and standardised way, independently from the language used by each user. Moreover, they allow a better quality of data and they permit a precise understanding of the data elements by using consistent values. One drawback of this solution is that code tables have to be maintained during the whole lifetime of the IT system.
- Take into account the existing specifications of data formats and communication protocols of ERRU and EUCARIS.
- Establish clear rules for data usage, including data protection rules.
- For each data format, implement backwards compatibility – so that in case of system updates, previous formats can be used together with new one.
- Use XML (eXtensible Markup Language) as a baseline for all data formats. This is the current state of the art format for data exchanges and is adopted by all main software providers and software tools.
- Together with the XML format, define an XML schema[61] - so that formatted data can be validated before data is provided – it will prevent formatting errors during data creation.

[61] From Wikipedia: An **XML schema** is a description of a type of XML document, typically expressed in terms of constraints on the structure and content of documents of that type, above and beyond the basic syntactical constraints imposed by XML itself.

- Together with XML format, define XSL (Extensible Stylesheet Language) allowing visualisation of the data into a human readable format, e.g. HTML (HyperText Markup Language). It will facilitate the development and the testing of data exchanges, allowing readability of the data by persons, including non-professionals.
- Use checksums or digital signatures in order to prevent data changes due to communication errors.
- Use UTF-8 for national encoding. This standard is widely adopted in EU systems including ERRU.
- Compress the data for the transfer – in order to reduce the size of the transaction.

6.3.1.2 Common roadmap for implementation of data flows.

The implementation of each data flow should include the following steps:

- As a pre-requisite, confirm/agree the use case requirements with relevant stakeholders and ensure common rules for the data format and structure are defined (see above).
- Define data format and data structure for the given data flow.
- Extend the existing communication interface.
- Ensure that Member States are ready for the implementation of the new data flow.
- Start the implementation at EU and Member State level.
- Integrate and test the solution. It is to be noted that integration tests with Member States involve many stakeholders, requiring substantial coordination effort and impacting the total elapsed time of the project.
- Deploy and maintain the solution.

6.3.1.3 Impact

The following impact was identified: legal basis has to be adopted concerning common data formats, data usage and possibly data protection rules. This impact all identified stakeholders.

6.3.1.4 Benefits

The following benefits were identified:

- A standardised data format at Union level for all data exchanges allows harmonisation and easier data handling by Member States and private stakeholders. It reduces the costs by increasing the productivity and minimizing waste and errors.
- An established standardised data format at Union level can be adopted and implemented nationally before the VIP is ready – it facilitates early start of the development at MS side.
- Common data protection and usage rules would ease the implementation of data exchanges.

6.3.2 Recommendations for implementation of VIP-VM

This part of the VIP system is responsible for data exchanges involving vehicle manufacturers. They are split into two (2) parts: PTI technical data and equipment technical information.

6.3.2.1 PTI technical data

As already described in section 5.2.1, the most feasible solution identified is a website serving as a single access point to PTI technical data provided by vehicle manufacturers.

It should be noted that there is no harmonised format and structure defined for PTI technical information. New technology in lighting, safety and other equipment require special testing procedures that are currently not standardised. The communication with the On-Board Diagnostic system (OBD) is not standardised but the connector (socket) is. The objective is to provide a read access to the information contained in the control unit of the OBD.

Regulation (EC) No 595/2009[62] already proposes such standardisation in the scope of emissions. That standardisation should cover a wider scope than emissions only, including PTI purposes.

The adoption of such common standard in the scope of PTI would completely eliminate the need of data exchange at the moment PTI is performed. Such implementation could be achieved in 2 ways:

- storing relevant PTI information in the OBD itself, using 'vehicle as a network'
- implementation of relevant PTI tests in the OBD

This requires that the compatibility with established standards is part of the vehicle type-approval process. Because such a solution requires a lead time of 20 to 30 years, this solution is disregarded from the current study.

6.3.2.1.1 Implementation guidelines

At the time of writing, the data format and access conditions to PTI technical data is subject to analysis by the Roadworthiness Committee Working Group.

Nevertheless some initial recommendations in the scope of definition of common data structure, format and access rules for PTI technical data are listed below:

- During the analysis of a possible standardisation of the data access, it has to be taken into account that the objectives of PTI and RMI are different. PTI is focused on specific, well defined test information while RMI supports various types of repair and maintenance activities for which information needs cannot be pre-defined. This difference needs to be considered in the context of the possible reuse of existing RMI websites for the VIP-VM. The following table gives a short overview of differences between the needs of PTI and RMI:

	PTI needs	Repair and maintenance needs
Objective	Detect failure - definitive decision through specific and well defined tests	Support repair - information
Scope	Safety related systems	Any part of the vehicle
Focus	System evaluation	Part repair, replacement and maintenance

Table 6-3: Comparison of the needs related to PTI and RMI

[62] Regulation (EC) No 595/2009 of the European Parliament and of the Council of 18 June 2009 on type-approval of motor vehicles and engines with respect to emissions from heavy duty vehicles (Euro VI) and on access to vehicle repair and maintenance information and amending Regulation (EC) No 715/2007 and Directive 2007/46/EC and repealing Directives 80/1269/EEC, 2005/55/EC and 2005/78/E, OJ L 188/1 of 18.07.2009

- Technical procedures guidelines:
  - The exact parameters for the redirection from the VIP central access point and the possible data access standardisation have to be identified by the Roadworthiness Committee Working Group appointed by EC. It should be noted that the VIN contains information denoting the manufacturer of the vehicle and the region in which the vehicle was produced.
  - For security reasons credentials to access vehicle manufacturers' PTI websites should be stored at PTI centres' level.
  - It should be noted that the current proposition for VIP-VM, using web forms, does not exclude the future use of web services, depending on how far these could be used based on data access rules and procedures.
  - Analyse whether defined access procedures would require additional requirements for the central access point to the PTI technical data.

6.3.2.1.2 Impact

Impact on EU institutions: The European Commission shall adopt implementing acts as they are stated in the functional requirement FR01 - Exchange additional technical data for the purpose of PTI.

Impact on Member States: Depending on the national organisation and legislation, PTI authorities may enforce PTI centres to connect to vehicle manufacturers' PTI information via the VIP National connection point, enabling centralised access control at from PTI authorities.

Impact on PTI centres: PTI centres need the information at the time they request it, meaning that communication with vehicle manufacturers becomes a critical factor in their day-to-day activities.

Impact on Vehicle Manufacturers: Vehicle Manufacturers own PTI technical data and have to provide updated information at the time it is requested.

6.3.2.1.3 Benefits

This simple solution to be implemented by the EC provides following benefits:

- Low cost of implementation and maintenance.
- Reliability can be easily assured.
- Possibility to reuse existing RMI websites and relevant technical procedures.

Vehicle manufacturers:

- Remain the owners of the data.
- Are responsible for the data provision and maintenance.
- Control the access to the data.
- Collect and control the possible payments for the access to data

6.3.2.1.4 Open issues

- It is unknown who will maintain and provide this data in case of vehicle manufacturers' bankruptcy – therefore this issue has to be further investigated.
- Relevant legal acts have to oblige vehicle manufacturers to keep the EU institutions up to date with the addresses of their PTI technical data websites– otherwise VIP-VM could not be kept up to date.

6.3.2.2 Equipment technical data

As already stated in section 5.1.2.1, it is assessed that the exchanges of this data can be done mainly in human readable format in the form of documentation e.g. via RMI websites of the vehicle manufacturer. Therefore, the exchange of equipment technical data for test equipment manufactures via VIP is considered as impractical. In parallel it was found that a central catalogue of vehicle manufacturer's websites could help equipment manufactures in finding relevant information.

Test equipment providers also need PTI technical data to test their equipment on specific vehicles. This information may be available through their specific access to vehicle manufacturers' websites.

6.3.2.2.1 Open issues

The exact scope of this data description and access rules have to be defined and adopted through relevant legal acts.

6.3.3 Recommendations for the implementation of VIP-MS

This part of the VIP serves the Member States' authorities in exchanging data between themselves and with the EU institutions. Four options were identified for the implementation of this component (see section 5.2.2).

The qualitative comparison of the options for this part of the VIP leads to the conclusion that re-using the system and the infrastructure managed by the EC is the best suited solution. This solution includes the delivery of the national RSI statistics by the Member States to the EU institutions.

6.3.3.1 Implementation guidelines and roadmap

- For the purpose of re-registration, the RW Certificate, CoC and vehicle history data entities can be exchanged in one message, reducing the number of messages exchanged in the scope of registration business flow.
- Member States belonging to the EReg association currently work together on the development of a common XML standard for the exchange of CoC with vehicle manufacturers. They have already agreed to a first version of the format, with the objective of harmonised electronic CoC data exchange at EU level. The structure also contains optional fields for additional technical information which are required by some national legislation.
  Therefore it is recommended to re-use this work for the further development of the CoC data format.
- For the simplicity of data exchanges it is recommended to always exchange the full scope CoC data, instead of using "CoC technical data" subset. This will unify and improve the exchanges, minimising waste and errors, without relevant impact on the traffic.
- It is recommended that the competent registration authority of a Member State is the owner of all the registration data related to one vehicle including CoC and complete vehicle history. In consequence all registration data would need to be transmitted to the registration authority at the time of re-registration of a vehicle in another Member State.
- As a best practice, for each message exchange proper monitoring and logging needs to be implemented allowing correct system maintenance, error detection, continuous system improvement and provision of system usage statistics. Therefore as a prerequisite for Option 1 it is recommended to implement a central database for

collection and analysis of logging data. This data would need to be submitted by all Member States.

- It is recommended to plan for a gradual development - starting with a simple system and then evolve:
  - Agree on common data formats – see implementation guidelines in section 6.3.1.1.
  - Start with the implementation of *UC07: Get/communicate RW certificate from/to other MS competent authorities.* The reasons are the following:
    - It allows early and quick start with a simple use case.
    - The content of the data entity is well defined and is the smallest one.
    - All interviewed MS already store this data in their registration registers – so the data to be exchanged is already in place.
    - This data is needed by all authorities: registration, PTI and RSI for the purposes of re-registration, PTI and RSI.
  - In the next step implement *UC01: Get/communicate CoC data*, together with other registration related use cases: *UC02: Notify a vehicle end-of-life*, *UC11: Get/Communicate vehicle historical data*.
    Reasons:
    - Implementation work on the data format of CoC has already started.
    - In some Member States, the CoC is already delivered electronically by vehicle manufacturers. But in some other MS this data is delivered to relevant authorities on paper. This means that these MS need to upgrade/extend their registers first.
    - The full set of registration related use cases will be implemented in one step.
  - Afterwards implement all RSI related use cases: *UC08: Get/communicate (previous) RSI report from/to MS competent authority, UC09: Notify MS competent authority on measures to be taken, UC14: Get/communicate undertaking's risk rate from/to other MS's RSI authorities, UC10: Send national RSI statistics to EU institutions*.
    Reasons:
    - Only 63% of interviewed MS have a centralised RSI register - this means that the other Member States need to develop their RSI registers first.
    - The full set of RSI related use cases will be implemented in one step.
  - Finally, in the scope of full mutual recognition of PTI, implement *UC06: Get CoC technical data.*
    - This data is needed in case PTI may be performed in any Member State.

The following figure provides an overview of the VIP-MS implementation steps.

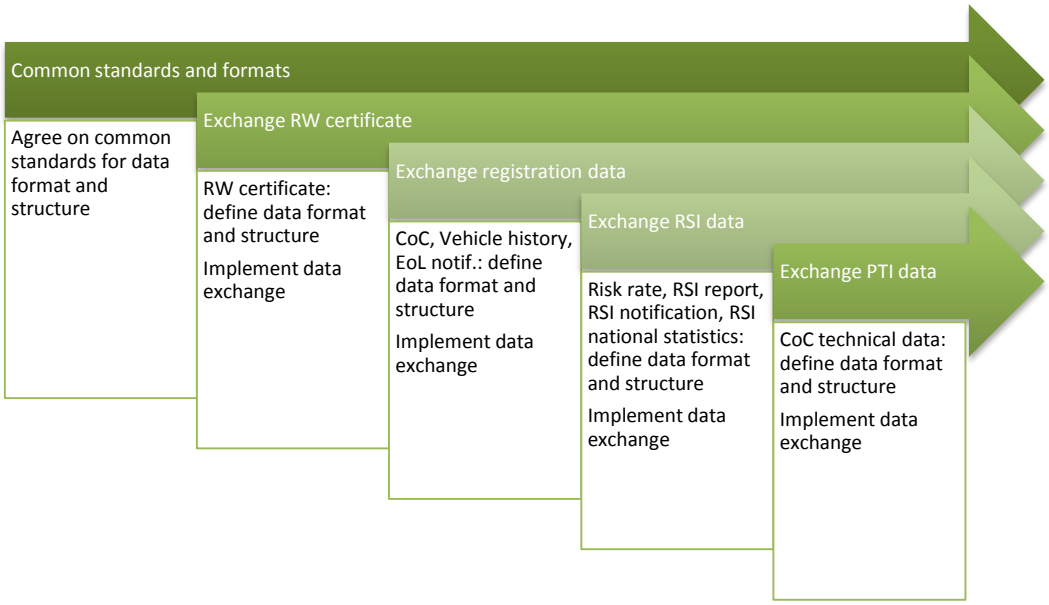

Figure 6-1: VIP-Member States implementation steps

6.3.3.2 Impact

Impact on Member States:

- Before implementation, Member States have to define how the national authorities will communicate with the VIP, identifying the number of VIP connection points they would need. Depending on the current national organisation, relevant authorities may have to implement additional national data exchanges. This was discussed in section 4.8 'Possible organisational arrangements'.
- Depending on the option chosen, some Member States may have to change their current connectivity to the ERRU system.
- The electronic storage of CoC data has to be ensured by all Member States.
- Some Member States have to establish centralised databases for PTI and RSI data.
- Vehicle historical data is a new concept and needs to be implemented in most of the Member States. The content, the data format and data structure for this data entity needs to be defined. Also, Member States have to organise themselves in order to be able to provide these data. An example could be taken from the Car-Pass system set-up in Belgium.
- The implementation of the international data exchanges at the moment of PTI execution requires further harmonisation of PTI testing procedures and rules in order to enable PTI to be performed in any Member State.

Impact on EU institutions

- On top of ensuring the communication at European level, data protection guidelines for the VIP-MS data exchange within the common EU data protection framework will need to be defined at EU level.
- The implementation of the international data exchanges at the moment of PTI execution requires further harmonisation of PTI testing procedures and rules in order to enable PTI to be performed in any Member State.

6.3.3.3 Benefits

- Maximum re-use of (resulting in low cost of implementation):
  - existing systems,
  - existing networks,
  - gained experience,
  - proven technical procedures
- Architecture with the best relative to:
  - scalability,
  - total cost of ownership,
  - resilience and manageability.
- Provides automation of the handling process for RSI national statistics provided by the Member States, leading to more regular sending, increasing data quality and correctness.

6.4 Proof of concept

The objective of the VIP proof of concept (POC) is to prove that the extension of the existing systems is viable. It is proposed that VIP re-uses and extends existing systems which are already used in a production environment. That's why there is no need for the implementation of a prototype in the proper sense of the word. Instead, and in the interest of time and costs, it is proposed to implement a proof of concept. The current section provides a precise roadmap for the implementation of the VIP POC through the description of:

- Specifications of the POC
- Implementation phases and schedule
- Specific resources and organisational needs
- Effort.

Annex 8.15 'VIP- Proof of Concept' provides more detailed information on the list of deliverables, tasks list and required staff needed for the implementation of the POC.

6.4.1 Specification

The methodology that was used to describe and estimate this POC is Rational Unified Process (RUP). For the Central part of the POC, it could be argued that RUP@EC should be applied; however due to the MS-related aspects it is deemed more appropriate to use an organization-agnostic methodology; hence the choice of the relatively wide-spread and generic RUP was made.
Cost estimates and schedules were calculated using Cost Xpert and cover the software development workload only. This workload is expressed in person-hours. Hardware costs were not taken into account as the reuse of existing platforms is assumed.

In order to address each sub-system, the POC aims to implement three use-cases, each use-case belonging to one of the sub-systems. They are assessed to cover the most architecturally relevant features of the system: all types of messages workflow, central storage of the reports and access to the Vehicle Manufacturers' websites. The following table provides an overview of the POC specifications. (detail on the use cases can be found in section 8.10.2 Data entities).

VIP system	VIP-EU	VIP-VM	VIP-MS
System Architecture	Re-use of VIP-MS (see below)	Web server with the database at the backend	Depending on the selected option, one of the existing systems, or re-use of MOVEHUB framework and platform (Option 4). See also design principles included in section 5.2.1.1 'Description'
Selected use case	UC10: Send national RSI statistics to EU institutions	UC03: Get access to VM's technical data information	UC07: Get/communicate RW certificate from/to other MS competent authorities
Data entities involved	Roadside inspection national statistics	Periodical technical inspection technical data	Roadworthiness certificate
Comments	This is applicable for Option B only. The objective of this use case in the POC is to ascertain and prove the viability of central storage of reports and messages work-flow	The use case implementation could be limited to one VM only in case the scope of the POC must be further limited.	This use case was selected because the data scope of the RW certificate is already well defined by the legislation. The objective of the POC is therefore to ascertain the messages work-flow.

Table 6-4: VIP POC specifications

6.4.2 Implementation phases and schedule

Following the RUP methodology, four phases are foreseen for the project:

- **Inception phase** – during this phase the project will be set-up and the initial set of requirements and use cases will be verified, confirmed and completed. As the development is based on the existing systems that are already in production all the relevant artefacts of these have to be collected and handed over – so they can be reused accordingly in the following phases of the project.
- **Elaboration phase** – the goal of the elaboration phase is to baseline the architecture of the system and other design documents of the system. During this phase, relevant documents will be updated as well.
- **Construction phase** - the goal of the construction phase is to clarify the remaining requirements and to complete the development of the system based upon the baselined architecture. Three (3) iterations are foreseen for this phase – one for each use case.
- **Transition phase** – in RUP the focus of the Transition Phase is to ensure that the software is available for the end users. For the POC, it is understood as an integration and testing phase with volunteering Member States and Vehicle Manufacturers. Three (3) iterations with one release each are foreseen in this phase.

The four phases of the POC implementation project should be executed in sequential order. The duration of each phase depends on the option of the VIP that is chosen. The table below presents estimated durations of all phases or each VIP option.

Project phase	Option 1 (EUCARIS only)	Option 2 (ERRU only)	Option 3 (ERRU + EUCARIS)	Option 4 (new system)
Inception phase	1 month	1 month	1 month	1 month
Elaboration phase	2 months	2 months	4 months	3 months
Construction phase	3 months	2 months	4 months	4 months
Transition phase	2 months	2 months	3 months	3 months
Total duration	**8 months**	**7 months**	**12 months**	**11 months**

Table 6-5: VIP POC: overall schedule

It appears that Option 2 has the shortest estimated duration. In cases where EUCARIS is reused it is assumed that central data storage is available prior the start of the POC project.

Tasks foreseen to be executed within scope of each phase of the project and required personnel for execution of these tasks can be found in the annex 8.15 'VIP- Proof of Concept.'

6.4.3 Specific resources and organisational needs

Apart from the staff required for the development of the POC, the following specific resources are needed:

- Volunteered Vehicle Manufacturer providing limited access to its RMI website.
- Volunteering Member States for the participation in the POC integration. It should be noted that the POC requires at least two volunteered MS. This is required because:
  - use case UC07 requires both a sender and a recipient of the message exchange
  - if option 1 is selected, both MS need to be connected to EUCARIS.
  - if option 2 is selected, both MS need to be connected directly to ERRU.
  - if option 3 is selected: one Member State has to be connected to ERRU via EUCARIS and the other one has to be connected to ERRU directly.
  - if option 4 is selected, 2 Member States have to implement a new connection.

  If no Member State volunteers for the Transition phase, it could be substituted by a testing tool.
- Dedicated environments for the development, test and acceptance of the POC with assured network connection to Member States and Vehicle Manufacturers.
- EC body responsible for the project governance. The following members should be appointed:
  - Product Owner responsible for overall management of requirements and change management.
  - Project Manager with standard responsibilities of the project management.
  - Project Secretary responsible for day to day activities supporting Project Manager including maintenance of the project correspondence and deliverables library.

6.4.4 Estimated costs

The cost of the POC implementation project is presented as two separate budgets:

- central development by the EC,
- development and integration of volunteering MS, taking into account that 2 MS are required (MS development).

The cost for VM is negligible as VM is expected to provide a limited access to their existing RMI website only.

For each option, the tables below presents the efforts for the POC implementation project. It should be noted that the costs for the MS are the total costs for 2 Member States.

Workload	Option 1 (EUCARIS only)		Option 2 (ERRU only)	
	# person-hours	# person-months	# person-hours	# person-months
Central development	4.299	27	3,660	23
Member State development (2 MS)	7,320	46	7,320	46
Total	**11,619**	**73**	**10,980**	**69**

Table 6-6: VIP POC: total costs – Options 1 and 2

Workload	Option 3 (ERRU+ EUCARIS)		Option 4 (new system)	
	# person-hours	# person-months	# person-hours	# person-months
Central development	7,237	45	5865	36
Member State development (2 MS)	7,320	46	9130	57
Total	**14,557**	**91**	**14 995**	93

Table 6-7: VIP POC: total costs – Options 3 and 4

The figures show that the lowest estimated effort concerns the Option 2, and that costs of POC are close to the costs of total central system development costs.

7 Conclusion

As a conclusion, the feasibility study shows that the VIP should be constituted of two (2) different components, depending on the stakeholders involved in the international data exchanges. Data exchanges involving private international stakeholders, mainly vehicle manufacturers, will occur on the part of the system called VIP-VM. Considering the high frequency of the exchanges, the high number of users and stakeholders' network access, periodical technical inspection centres should connect to the vehicle manufacturers' website via a secure internet connection in order to obtain the data they need to perform the tests on a specific vehicle. This part of the system requires the most effort in terms of stakeholders' agreements on data definition, data format, data structure and data access. These agreements need to be reflected in the legislation.
One of the benefits of this system is that it allows the testing of the electronic safety equipment, contributing to enhanced road safety.

Data exchanges involving national authorities and the EU institutions will take place on the part of the system called VIP-MS. The assessment shows that the VIP-MS is implemented on the platform owned and managed by the EC (MOVEHUB), using the inter-institutional network currently in use (sTESTA). This system could extend the existing ERRU system, or may be a new one based on MOVEHUB platform. Depending on the option selected, this solution requires some Member States to change their connectivity to the ERRU system, or all Member States to implement a new connection to the new VIP-MS system.
This system enables national authorities to facilitate information exchange allowing better follow-up of defective vehicles.

In terms of consumer protection, the new legislation foresees the availability of vehicle accident information and odometer readings. The study highlighted the need for a gradual implementation of this functionality, starting with the collection and the provision of odometer readings. Because accident data information is more sensitive and not clearly defined, additional support and involvement from Member States and stakeholders active in the accident domain are needed. Odometer readings are already recorded in many systems and the collection of this information may be easily done. That information is foreseen as being part of vehicle history data exchanged between the registration authorities. In the future, this information may easily be extended to accident information. That gradual implementation provides the following benefits:

- Increase the knowledge from citizens on vehicle history and state. Odometer values reported at different moments of the vehicle lifecycle provides better information on the real state of the vehicle.
- Some accidents may trigger additional PTI tests, impacting proper repair and enhancing road safety,

Regarding the implementation roadmap of the whole VIP, the study shows that a common data format and structure is a pre-requisite for the implementation of the VIP. This will benefit all stakeholders by facilitating data exchanges and increasing data quality at all levels of the vehicle life cycle.
Several initiatives already started regarding the electronic exchange of CoC data between vehicle manufacturers and registration authorities, and the definition of PTI technical data needed from vehicle manufacturers to perform test electronic safety components.

Once data formats are agreed on, the implementation of both components may occur in parallel. Taking into account current Member State's readiness to these exchanges, the implementation roadmap for VIP-MS suggest a gradual implementation of international data exchanges in the following order: RW certificate, registration data, RSI data and, last but not least, CoC technical data.

The implementation roadmap for VIP-VM considers more technical aspects. In a first step, implement VIP-MS in the form of a web-page enabling the PTI centres to provide the VIN of the vehicle under test. With minimised manual interactions, the system provides the PTI centre with PTI technical data needed to test a specific vehicle. That information may then be downloaded to the testing equipment so that specific tests can be performed. Future full automation of the exchange may be easily implemented between the testing tool itself and the vehicle manufacturers' website. This requires the use of web services on top of the existing VIP-VM infrastructure.

8 Annexes

ID	Title
0	Acronyms & Abbreviations
8.2	The current legal framework
8.3	Overview of the current studies and information
0	Stakeholders active at international level
0	Project methodology and work performance
8.6	Main Study Instruments
8.7	Contact list
8.8	Findings on Member States view
8.9	MS profiles
8.10	Requirements detailed
8.11	Responsibilities inside MS
8.12	Data flows characteristics
8.13	Current Member States connectivity to existing systems
8.14	Costs estimates
8.15	VIP- Proof of Concept
8.16	Costs and benefits analysis of collecting information on odometer readings and vehicle accident history

Table 8-1: List of annexes

8.1 Acronyms & Abbreviations

Acronym or Abbreviation	Meaning
ABS	Anti-lock Braking System
.NET	.NET Framework, a software framework by Microsoft
ACEA	European Automobile Manufacturers Association
AT	Austria
AUTOFORE	Study on the Future Options for Roadworthiness Enforcement in the European Union
BE	Belgium
BG	Bulgaria
CADaS	Common Accident Data Set
CARE	Community database on Accidents on the Roads in Europe
CBE	Cross Boarder Exchange
CEN	European Committee for Standardization
CITA	Comité international de l'Inspection Technique Automobile (International Motor Vehicle Inspection Committee)
CoC	Certificate of Conformity
COM	The European Commission (DG MOVE)
COTS	Commercial off-the-shelf
COWI	COWI A/S - an international consulting group
CSV	Comma-Separated Values file format
CY	Cyprus
CZ	Czech Republic
DE	Germany
DG MOVE	European Commission Directorate-General for Mobility and Transport
DK	Denmark
DRM	Digital Rights Management
DTC	Diagnostic Trouble Codes
EBA	Emergency Brake Assist
EBS	Electronic Braking System
EC	European Commission
eCall	European initiative intended to bring rapid assistance to motorists involved in a collision anywhere in the European Union
ECHR	European Convention on Human Rights
ECSS	Electronic Controlled safety Systems
ECU	Electronic Controlled Unit
EE	Estonia
EGEA	European Garage Equipment Association
EL	Greece
EPS	Electronic Power Steering
EReg	Association of European Vehicle and Driver Registration Authorities
ERRU	European Register of Road Transport Undertakings

Acronym or Abbreviation	Meaning
ES	Spain
ESC	Electronic Stability Control
EU	The European Union
EUCARIS	EUropean CAR and driving license Information System
EUR	Euro
EURO	EURO 5/6, EURO VI - European emission standards
FAQ	Frequently Asked Questions
FI	Finland
FR	France
FTP	File Transfer Protocol
FTPS	FTP Secure
GOCA	Groupement des entreprises agréées pour le contrôle automobile et le permis de conduire (BE)
HR	Croatia
HTML	HyperText Markup Language
HTTPS	Hypertext Transfer Protocol Secure
HU	Hungary
IBM	International Business Machines Corporation
ICT	Information and Communications Technology
ID	Identifier
IDELSY	Initiative for Diagnosis of Electronic Systems in Motor Vehicles
IE	Ireland
IG	Interview Guide
IIS	Internet Information Services
ISDN	Integrated Services for Digital Network
ISO	International Organization for Standardization
IT	Italy
IT	Information Technology
JSON	JavaScript Object Notation
KB	Kilobyte
LT	Lithuania
LU	Luxembourg
LV	Latvia
MB	Megabyte
MS	EU Member State
MS	Member State
MT	Malta
MTTR	Mean Time To Repair
N/A	Not applicable or not available or no answer
NAN	National administration network
NCP	National Contact Point
NL	Netherlands
OASIS	Organization for the Advancement of Structured Information Standards

Acronym or Abbreviation	Meaning
OBD	On Board Diagnostics
PDF	Portable Document Format
PL	Poland
PM	Particulate matter
Prüm	Treaty combating terrorism and cross-border crime
PTI	Periodic Technical Inspection
QST	Questionnaire
R&I	Registration & Information
RA	Registration authority
REG	Registration
RESPER	Reseau Permis de conduire
RMI	Repair and Maintenance Information
RO	Romania
RSI	Road Side Inspection
RUP	IBM Rational Unified Process
RW	Roadworthiness
SE	Sweden
SI	Slovenia
SK	Slovakia
SLA	Service Level Agreement
SPOC	Single Point of Contact
sTESTA	Secure Trans European Services for Telematics between Administrations
TACHOnet	Telematics Network for the Exchange of Information Concerning the Issuing of Tachograph Cards
TCO	Total Cost of Ownership
TFEU	Treaty on the Functioning of the European Union
UC	Use Case
UCS	Universal Character Set
UIS	Unisys
UK	United Kingdom
UML	Unified Modeling Language
UTF-8	UCS Transformation Format—8-bit
WMI	World Manufacturer Identifier (used in VIN)
VIN	Vehicle Identification Number
VIP	Vehicle Information Platform
VM	Vehicle Manufacturers
XLS	Microsoft Excel file format
XML	eXtensible Markup Language
XSL	Extensible Stylesheet Language

Table 8-2: Acronyms & Abbreviations

8.2 The current legal framework

This section enlists the main pieces of legislation at EU-level related to the vehicle life-cycle.

8.2.1 EU legislation related to the vehicle life cycle

This section provides an overview of current EU legislation in place before the new RW package was adopted in March 2014.

Type approval related EC Directives and Regulations:

- Directive 2002/24/EC of the European Parliament and of the Council of 18 March 2002 relating to the type-approval of two or three-wheel motor vehicles and repealing Council Directive 92/61/EEC (OJ L 124/1 of 6.5.2002).
- Directive 2003/37/EC of the European Parliament and of the Council of 26 May 2003 on type-approval of agricultural or forestry tractors, their trailers and interchangeable towed machinery, together with their systems, components and separate technical units and repealing Directive 74/150/EEC (OJ L 171/1 of 9.7.2003).
- Directive 2007/46/EC of the European Parliament and of the Council of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles (OJ L 263/1 of 9.10.2007).
- Regulation (EC) No 595/2009 of the European Parliament and of the Council of 18 June 2009 on type-approval of motor vehicles and engines with respect to emissions from heavy duty vehicles (Euro VI) and on access to vehicle repair and maintenance information and amending Regulation (EC) No 715/2007 and Directive 2007/46/EC and repealing Regulation (EC) No 715/2007 of the European Parliament and of the Council of 20 June 2007 on type approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information (OJ L 188/1 of 18.07.2009).
- Regulation (EU) No 168/2013 of the European Parliament and of the Council of 15 January 2013 on the approval and market surveillance of two- or three-wheel vehicles and quadricycles.
- Commission Directive 2013/60/EU of 27 November 2013 amending for the purposes of adapting to technical progress, Directive 97/24/EC of the European Parliament and of the Council on certain components and characteristics of two or three-wheel motor vehicles, Directive 2002/24/EC of the European Parliament and of the Council relating to the type-approval of two or three-wheel motor vehicles and Directive 2009/67/EC of the European Parliament and of the Council on the installation of lighting and light-signalling devices on two- or three-wheel motor vehicles
- Commission Delegated Regulation (EU) No 3/2014 of 24 October 2013 supplementing Regulation (EU) No 168/2013 of the European Parliament and of the Council with regard to vehicle functional safety requirements for the approval of two- or three-wheel vehicles and quadricycles
- Commission Delegated Regulation (EU) No 44/2014 of 21 November 2013 supplementing Regulation (EU) No 168/2013 of the European Parliament and of the Council with regard to the vehicle construction and general requirements for the approval of two- or three-wheel vehicles and quadricycles
- Commission Delegated Regulation (EU) No 134/2014 of 16 December 2013 supplementing Regulation (EU) No 168/2013 of the European Parliament and of the

Council with regard to environmental and propulsion unit performance requirements and amending Annex V thereof

- Commission Directive 2014/44/EU of 18 March 2014 amending Annexes I, II and III to Directive 2003/37/EC of the European Parliament and of the Council on type-approval of agricultural or forestry tractors, their trailers and interchangeable towed machinery, together with their systems, components and separate technical units
- Commission Directive 2014/43/EU of 18 March 2014 amending Annexes I, II and III to Directive 2000/25/EC of the European Parliament and of the Council on action to be taken against the emission of gaseous and particulate pollutants by engines intended to power agricultural or forestry tractors
- Regulation (EC) no 661/2009 of the European Parliament and of the Council of 13 July 2009 concerning type-approval requirements for the general safety of motor vehicles, their trailers and systems, components and separate technical units intended therefore

Registration related EC Directive:

- Council Directive 1999/37/EC of 29 of April 1999 on the registration document for vehicles, (OJ L138/57 of 1.06.1999) sets out the requirements for the issuing of registration certificates, their mutual recognition and the harmonised minimum content of vehicle registration certificates.
- Directive 2014/46/EU of the European Parliament and of the Council of 3 April 2014 amending Council Directive 1999/37/EC on the registration documents for vehicles

PTI related EC Directive:

- Directive 2009/40/EC of the European Parliament and of the Council of 6 May 2009 on roadworthiness tests for motor vehicles and their trailers (OJ L 141/12 of 6.6.2009), fixes minimum standards for the periodic roadworthiness tests of motor vehicles - these are the regular vehicle checks required by law. The Directive applies to passenger cars, buses and coaches and heavy goods vehicles and their trailers, but not to scooters and motorbikes.
- Commission Directive 2010/48/EU of 5 July 2010 adapting to technical progress Directive 2009/40/EC of the European Parliament and of the Council on roadworthiness tests for motor vehicles and their trailer (OJ L 173/47 of 8.7.2010).
- Directive 2014/45/EU of the European Parliament and of the Council of 3 April 2014 on periodic roadworthiness tests for motor vehicles and their trailers and repealing Directive 2009/40/EC.

RSI related EC and EU Directive:

- Directive 2009/40/EC is complemented by Directive 2000/30/EC of the European Parliament and of the Council of 6 June 2000 on the technical roadside inspection of the roadworthiness of commercial vehicles circulating in the Community (OJ L 203/1 of 10.8.2000). The Directive 2000/30/EC provides the requirement to control the technical state of commercial vehicles in between periodic inspections (with technical roadside inspections). These are additional on-the-spot roadside checks for commercial vehicles.
- Commission directive 2010/47/EU of 5 July 2010 adapting to technical progress Directive 2000/30/EC of the European Parliament and of the Council on the technical

roadside inspection of the roadworthiness of commercial vehicles circulating in the Community (OJ L 173/33 of 8.7.2010).

- Directive 2014/45/EU of the European Parliament and of the Council of 3 April 2014 on the technical roadside inspection of the roadworthiness of commercial vehicles circulating in the Union and repealing Directive 2000/30/EC.

Vehicle End-of-life related EC Directive:

- Directive 2000/53/EC of the European Parliament and of the Council of 18 September 2000 on end-of-life vehicles (OJ L 269, of 21.10.2000).

8.2.2 EU legislation related to data protection.

In the scope of the EU legislation related to data protection, EU Fundamental rights and general EU principles should be considered. With the entry into force of the Lisbon Treaty[63], the Charter of Fundamental Rights[64] acquired a binding force and forms part of the Union's primary law. Article 8 of the Charter[65] serves as an extension of the right to privacy provided for in Article 8 of the European Convention on Human Rights (ECHR)[66]. Article 16 of the Treaty on the Functioning of the European Union (TFEU)[67] supplements the above mentioned provision of the Charter when providing directly enforceable rights to all persons to data protection.

The EU's secondary legislation provides a rather complex and dispersed normative framework as regards rules on data protection.
First of all, the Directive on the protection of individuals with regard to the processing of personal data and on the free movement of such data (hereafter the Data Protection Directive[68] - see also the directive FAQ[69]) lays down general guidelines with respect to lawful processing of personal data.
The Regulation on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data[70] has a similar scope but applies to data processing by EU institutions and bodies.

Another key EU instrument is the Data Retention Directive 2006/24/EC [71] applied to data processing with regard to communications services. New legal provisions are underway in the 2012/0011 (COD)- Proposal for a Regulation of the European Parliament and of the Council[72] on the protection of individuals with regard to the processing of personal data and on the free movement of such data (General Data Protection Regulation).

[63] Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community, signed at Lisbon, 13 December 2007, (OJ C 306 of 17.12.2007)
[64] Charter of Fundamental Rights of the European Union, OJ C 364/01 of 18.12.2000
[65] Art. 8, idem
[66] Convention for the Protection of Human Rights and Fundamental Freedoms as amended by Protocols No. 11 and No. 14, Rome, 4.XI.1950
[67] Treaty Establishing The European Community (2002), *consolidated version, C 325/35 of 24.12.2002*
[68] Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, OJ L 281/31 of 23.11.1995
[69] Data Protection Directive of 1995 Frequently Asked Questions, of May 2002
[70] Regulation No 45/2001 of the European Parliament and of the Council of 18 December 2000 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data, OJ L8/1 of 12.01.2001
[71] Directive 2006/24/EC of the European Parliament and of the Council of 15 March 2006 on the retention of data generated or processed in connection with the provision of publicly available electronic communications services or of public communications networks and amending Directive 2002/58/E, OJ L 105/54 of 13.04.2006
[72] Proposal for a Regulation of the European Parliament and of the Council on the protection of individuals with regard to the processing of personal data and on the free movement of such data (General Data Protection Regulation), Brussels, 25.1.2012, COM(2012) 11 final, 2012/0011 (COD)

8.3 Overview of the current studies and information

The following information from previous studies and information gathered from the Internet was collected:

Previous studies, projects / owner	Purpose of study	Main points impacting VIP
Autofore / CITA[73]	Understand PTI business processes and data exchanged.	How BE and ES are organised, functional needs in respect of future new RW package
RW package impact assessment[2] / EU COM	Understand how the current PTI and RSI are organized in the MS.	Currently it is not possible to perform a PTI for a vehicle registered in another MS There is a need for more technical information exchange between manufactures and PTI centres
The Vehicle Chain / EReg [74]	Overview of the vehicle life cycle in different countries.	How countries manage the vehicle life cycle
Initiative for Diagnosis of Electronic Systems in Motor Vehicles for PTI (IDELSY[75]) / EU COM	To evaluate if it is possible to find a practical PTI test procedure for electronic components by using a generic scan tool for the existing vehicle fleet in Europe.	Data flows in the context of PTI and diagnosis of electronic systems in motor vehicles.

Table 8-3: Overview of previous studies and projects in the scope of PTI

8.3.1 Study on the Future Options for Roadworthiness Enforcement in the European Union (AUTOFORE)

The AUTOFORE study was funded by the European Commission and 12 co-funding organizations belonging to the consortium led by CITA to review the roadworthiness enforcement and inspection in Europe.

The purpose of the AUTOFORE study is to recommend improvements in roadworthiness enforcement in the European Union to ensure that the benefits accruing from the original design and manufacture of vehicles are retained, where justified, throughout the life-cycle of those vehicles.

The study, conducted through a questionnaire, ended up with the following recommendations:

[73] AUTOFORE (2007), Study on the Future Options for Roadworthiness Enforcement in the European Union
[74] E-REG (2011), The Vehicle chain in Europe 2011, a survey of Vehicle and Driving Licence Procedures Part one, of May 2011 ; E-REG (2011); The Vehicle chain in Europe 2011, a survey of Vehicle and Driving Licence Procedures Part two, of May 201
[75] IDELSY (2006), Initiative for Diagnosis of Electronic Systems in Motor Vehicles for PTI, Project Details, 01.1.2004 until 1.12.2005 ; IDELSY (2006), Initiative for Diagnosis of Electronic Systems in Motor Vehicles for PTI, Management Summary, 19.04.2006

- Increase the frequency of inspection for older vehicles of categories 5 and 6 as defined in Directive 96/96/EC[76];
- Include the examination of safety relevant electronic systems that are already widely fitted (airbags, ABS and ESC);
- Include two-wheeled motor vehicles.

8.3.2 Roadworthiness package impact assessment

The Roadworthiness Package Impact Assessment[2] is a report created as a result of a public consultation performed in 2010 on the situation of the PTI systems in Europe.
Among the findings, a correlation between fatalities and requirements on test quality has been demonstrated together with the deficiencies of the current system like:

a. Data for testing electronic safety components is often not available.
b. The potential of the odometer readings is not used.
c. PTI certificates are not fraud-proof.
d. Data on PTI results are not available to enforcements authorities.

With the final objective of halving the number of fatalities by 2020, a cost benefit analysis has been conducted among different policy options, where the need of a vehicle technical data exchange system (VIP) linking existing vehicle databases emerged.

8.3.3 Initiative for Diagnosis of Electronic Systems in Motor Vehicles for PTI (IDELSY)

The IDELSY project was partly funded by the EU, and was supported by several technical services from several European Member States. In its goal to enhance European road safety, IDELSY provided collective support for the EU - Commission to improve the existing regulations suitable for the new generation of motor vehicles.
In front of this overall target, seven European technical inspection organisations launched a research project at the beginning of 2004. As a result, the project developed test procedures for dealing with the test of complex electronic safety systems in new vehicles undergoing roadworthiness checks.

[76] COUNCIL DIRECTIVE 96/96/EC of 20 December 1996 on the approximation of the laws of the Member States relating to roadworthiness tests for motor vehicles and their trailers

8.4 Stakeholders active at international level

8.4.1 Test equipment providers European garage Equipment Association (EGEA).

The European Garage Equipment Association regroups 11 national professional associations representing the interests of both manufacturers and importers of garage equipment.
On 8th September this year the Commission published an "Invitation to Tender" for a "Study on a test for electronic safety components at roadworthiness tests". The good news was that the tender specification fits very closely with the CITA proposed project.
In partnership with CITA and other key independent research/university organisations, EGEA is performing the study.

According to the current status of the study, the probable list of mandatory Electronic Controlled Safety Systems (ECSS) to be checked during PTI is the following (Extract of ECSS tender):

- Anti-lock Braking System (ABS);
- Electronic Stability Control (ESC);
- Electronic Braking System (EBS);
- Electronic Power Steering (EPS);
- Emergency Brake Assist (EBA);
- Supplemental Restraint Systems (SRS);
- Safety Belt Load Limiter;
- Safety Belt Pretensioner;
- Airbag.

8.4.2 European Automobile Manufacturers Association (ACEA)

ACEA represents manufacturers of cars, vans, trucks and busses with production centres in the EU. Because technical vehicle information data for ECSS are needed for PTI, ACEA is a stakeholder for our study.

8.4.3 International Motor Vehicle Inspection Committee (CITA)

CITA is an international not-for-profit association, based in Brussels, Belgium. It represents all types of organisations and stakeholders (government, private sector, dedicated inspection centres, garage-based test centres and test equipment manufacturers) who share a common interest in exchanging information, developing best practices and draft international standards in the field of road vehicle inspection.

Its work focuses on improving transport sustainability with particular emphasis on road safety and environmental protection.

8.5 Project methodology and work performance

To reach the proposed objectives, the team decided to follow the approach depicted below, which comprised four distinct methods:

- Desktop research;
- Use of questionnaires;
- Visits and interviews to EU Member States and relevant stakeholders;
- Consolidation and analysis.

1. Desktop research

The desktop research included the review of the legal framework and relevant studies and reports surrounding the study objectives. The information collected was used during the earlier stages of the project to prepare the questionnaires. Also, it served as a sustained base of knowledge during the later stages while performing analysis and consolidation.

The study team decided to take a bottom-up approach, hence contacted the Member States to receive expert input to sustain the final conclusions and recommendations. The study aimed at approaching all the EU Member States. The high number of Member States involved in the study, together with the different authorities involved in each Member State, resulted in the decision of finding a Single Point of Contact (SPOC) in each Member States.

Having a SPOC per Member States ensured that all the communication with the Member State was maintained through one channel. Besides, having the responsibility of being the point of contact of all communication related to the study, the other responsibilities of the SPOC can be summarised as following:

- receiving and disseminating the questionnaires and other relevant information to the competent authorities in the Member States;
- collecting the questionnaires responses and submitting them to the study team;
- helping organising the meetings with relevant stakeholders of the Member State during the visits.

2. Use of questionnaires

Questionnaires in this study were used to collect information from the different national authorities. This method was used due to its easy approach on information collection in a structured way to be later analysed and compiled. They were dispatched to the various stakeholders via email (21 questionnaires sent to the SPOC multiply by 2 (one Register and one Country)) with follow-up remote interaction (via phone or email), when needed.

The questionnaire contains a comprehensive introduction to the study and aimed at collecting different types of information, including data on the current situation in the Member States, at legal, organisational and technical level. The evolution of current national systems was also assessed from a legal, technical and financial point of view. The last section aimed at evaluating the Member States' opinions about the future of Vehicle Information Platform at EU level.

The questionnaire followed a closed question approach for the majority of the questions, to allow an easier consolidation of the collected information and to be able to provide standardised statistical

results. In each question, there was also the possibility to complement the answer by providing feedback. The structure enabled collecting opinions that could be further analysed during the interviews with Member States.

The first draft of the questionnaires was sent to different stakeholders for review. Spain and Netherlands, Member States used as pilot countries, were requested to review it, together with European Commission, ACEA, EReg, EGEA, and CITA. Upon the receipt of the comments, the questionnaire was further enhanced. A pilot meeting was held in The Netherlands on 26 November 2013. Following this first visit, the questionnaire was slightly updated based on the comments received. The final version was sent to the Commission on 19 December 2013 and the version was sent to the remaining Member States.

It was stipulated that the questionnaires would be sent with a minimum of three weeks in advance to the Member States' visits. All Member States that were visited received therefore the questionnaire well in advance of the meeting, to give them sufficient time to disseminate the documents to all relevant stakeholders.

The questionnaires were adapted and sent to international stakeholders (ACEA and EGEA).

3. Visits and interviews

Visits to the Member States were held in the form of Focus Groups meetings. These meetings involved a structured face-to-face contact with different experts. The high added value was in the possibility to discuss questions from different perspectives. The involvement of experts from different organisations (national authorities or private companies) provided ground for deeper discussions about practicalities, needs and priorities.

The SPOCs were responsible for inviting PTI and RSI representatives and any other experts in the area of vehicle registration to the focus meetings.

The representatives from the organisations responsible for RSI, PTI, Type approval and Registration having been involved in different types of technical data exchange activities.

As mentioned above, the first meeting was held in NL on the 26/11/2013 at Rotterdam and served two purposes. On one hand, it was an actual visit to a Member States to collect further information from the national experts. On the other hand, it allowed for a first meeting experience. The team agreed with the NL (RDW) authorities to have them as a pilot to test the methods for conducting the meeting and evaluate the relevance of the study tools (the questionnaires and the "Interview Guide" provided to the Member States prior to the meeting).

The meeting participants were assured that the collected information would not be disclosed "as is" but would be consolidated and used in statistical reporting or as summarised analysis and would not be in any way associated with a singular Member States.

The "Interview Guide" (IG) was a document sent to the Member States and consisted of a set of exercises to guide the meeting. During the meetings, the Member States could request clarification about questions from the questionnaires, and provide further information (e.g. presentation of the organisations present at national level). The discussions during the meeting sessions were considered as potential solutions that could be transposed into practical solutions or recommendations.

The information collected during the meetings was compiled into minutes and sent for review to the visited Member States, usually five working days after the event. This ensured that no misinterpretation of the discussions was made. These meeting minutes were later used during the analysis and consolidation phase.

The typical meeting agenda followed the structure below:

Agenda:

1. Presentation and introduction of the study, where the study team introduced the methodology and objectives of the study.

2. Current situation regarding the organisation of PTI and RSI in the Member States. Meeting participants introduced themselves. The National Authority presented their organisation and some clarifications regarding the functions and processes at national level were made.

3. Review of questionnaire findings - Based on the Member States' answers to the questionnaire, the team analysed and selected some questions that were discussed more in depth with the meeting attendees. The selected questions varied from one Member States to another and were highly dependent on the amount of data provided in the questionnaire. This part of the meeting generally lasted longer, due to the intervention of the various meeting participants and the discussions that arise. Other questions not detailed in the IG were also approached.

4. Open discussion on possible Vehicle Information Platform at EU level – Usually, the last part of the meeting was dedicated to open discussions over the exchange of vehicle information in between Member States and how could this be improved by a future Vehicle Information Platform.

As for Member States, an interview was held with international stakeholders (ACEA and EGEA) with the same approach then for Member States. The agenda of these interviews was similar to the agenda of the interviews of the MS, with the exception of the current situation of PTI and RSI in the Member State.

4. Consolidation and analysis

Once the information was collected (through the desktop research, the study questionnaires and interviews), the analysis of the information was conducted. It included legal, business, technical and financial assessments. The results were assessed in the light of relevant studies, policies and legislation. The intermediary findings presented in the interim report were further elaborated once all study interviews with Member States and meetings with relevant experts were conducted.

After analysing the existing systems and how a future EU system could integrate among them, the needs of MS and the requirements coming from EU level, study recommendations on the VIP system were formulated.

In parallel with this bottom-up analysis, a top-down approach was adopted. It aimed at defining those business processes that could potentially be implemented and achieved through the VIP system.

8.6 Main Study Instruments

8.6.1 Questionnaires

8.6.1.1 Country Overview

DG MOVE
Unit C4: Road Safety

Project: Vehicle Information Platform

Questionnaire for the feasibility study of a European Vehicle Information Platform - Country overview

Country report <*Country name*>

(MOVE-VIP-QST-001)

Abstract

In the scope of the Vehicle Information Platform feasibility study, this questionnaire has the objective to collect all necessary information on Periodic Technical Inspection and Road Side Inspection national processes and organisation.

Document information

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Contents

1 CONTEXT OF THE VEHICLE INFORMATION PLATFORM

In 2010, The European Commission, Directorate General for Mobility and Transport (DG MOVE) led an Impact assessment study on Roadworthiness Package. This study was triggered by the fact that there are too many vehicles with technical defects on the road causing accidents, injuries and fatalities. The study provided evidence on the link between road safety improvement and higher roadworthiness requirements.

The study also identified two root causes of the high level of technical defects:

- The scope of the current EU legislation is too narrow and the level of requirements it sets is too low
- Concerned actors don't exchange information and vital data for effective tests and test results enforcement

In order to increase road safety, the EU decided to update current roadworthiness regulations in order to take the vehicle's technological evolution into account and to enable the implementation of a vehicle information data exchange platform. The purpose of this system is to exchange technical information related to the vehicles only.

The updated regulation proposal specifies that member states (MS) competent authority shall exchange data. This updated regulation will support the data-exchange platform. One of the objectives aims towards a more harmonised Periodic Technical Inspection process throughout the EU.

An important aspect of this new regulation foresees that vehicle manufacturers shall provide Periodic Technical Inspection (PTI) centres or National Authorities with the necessary technical information for roadworthiness testing.

Article 15 of the new Regulation proposal on periodic roadworthiness tests requires the Commission to examine the feasibility, costs and benefits of the implementation of an electronic Vehicle Information Platform (VIP).

The objective of this platform VIP is to enable competent authorities of MS, roadworthiness test centers and vehicle manufacturers to exchange technical information related to vehicle approval, vehicle registration and vehicle testing.

2 CONTEXT OF THE PRESENT STUDY

In June 2013, the Commission contracted Unisys Belgium to conduct the feasibility study of a Vehicle Information Platform. The study includes desk-based research and interviews with different stakeholders in MS. These last are conducted in a two-step process:

- E-mail questionnaires sent to stakeholders of MS for collecting general and specific background information on Vehicle information.
- Possible face-to-face interviews with stakeholders in MS to understand the different perspectives and gather more in-detail information where needed.

The key objective of this questionnaire is to gather information about your national organization and systems dealing with roadworthiness processes, focusing on data exchange with other MS.

This Questionnaire offers you the chance to provide the European Commission with more insights on your current organisation. Moreover, it offers you the possibility to clarify and communicate your needs and priorities in this domain.

2.1 About the questionnaire

This questionnaire aims to understand the current national organisation in terms of Vehicle Approval, Vehicle Registration, Periodic Technical Inspection (PTI) and Road Side Inspection (RSI). This part also addresses the future national needs and requirements linked to the implementation of a Vehicle Information Platform.

The European Commission requests to have this questionnaire filled in and sent back 3 working weeks after reception.

This questionnaire is the complement of other questionnaires that have been sent to the owners of national registers/systems which has been identified as being part of the existing vehicle information registers/systems of your MS. The objective of these complementary questionnaires is to gain more detailed information on the system itself and the data exchanged. Future needs and requirements linked to the Vehicle Information Platform are also addressed.

2.2 How to complete this questionnaire

To help you answering the Questionnaire in an efficient manner, we have used different kinds of questions; open questions, check boxes and tables to be filled in. Editable paragraphs where you can provide your answers are highlighted.

Some questions give you the opportunity to provide comments or to give more explanation.

When answering the questions, please keep in mind that the purpose is to gain a clear understanding and overview on how vehicle information data is organized in your country, what the communication channels are and how vehicle information is exchanged with other MS.

Additionally, the questions give you the opportunity to provide your comments and suggestions on vehicle information exchange with other MS.

2.3 Important notice

For further enquiries regarding the project in general or this questionnaire, do not hesitate to send an e-mail to the following e-mailbox: VIPstudy@unisys.com.

2.4 Guarantee of Confidentiality

This individual questionnaires will be disclosed "as-is" to the European Commission, but not "as-is" to any other party. However the findings will be consolidated in a general overview or in comparative tables for the purpose of study or trend analysis.

Personal information concerning contact names is needed for further contacts. This information will not be disclosed "as-is" to any party and will only be used by the European Commission in the scope of the study.

3 THE EXISTING NATIONAL ENVIRONMENT FOR VEHICLE INFORMATION

This part of the questionnaire allows to clarify how National Authorities are organized for the follow-up of Vehicle Life Cycle information. It will also improve the European Commission's understanding of the legal context of the National Roadworthiness system.

3.0. Please fill in information about the person replying to the questionnaire:

This information is needed for the European Commission to have a contact name in case they would need clarifications on the responses.

Surname:

Name:

Email:

Phone (with international prefix):

Organisation:

Function

Surname:

Name:

Email:

Phone (with international prefix):

Organisation:

Function:

3.1 PTI and RSI current organisation and stakeholders

3.1.1 Please identify which stakeholders are active in Periodic Technical Inspection (PTI) and Roadside Inspection (RSI) processes at national and international level:

Authorities/stakeholders active in PTI and RSI
☐ National Vehicle Type Approval Authorities
☐ National Vehicle Type Approval Authorities from other MS
☐ National Registration Authorities
☐ National Registration Authorities from other MS
☐ PTI responsible national authorities
☐ PTI responsible national authorities from other MS
☐ PTI centres
☐ RSI responsible national authorities
☐ RSI responsible authorities from other MS
☐ Manufacturers head offices: please specify:
☐ National associations representing vehicle manufacturers
☐ EU institutions: please specify:
☐ Other actors linked to PTI and RSI business processes, please specify:

Table 1: List of stakeholders

Additional comment:

3.1.2 How is Periodic Technical Inspection (PTI) organised in your MS? Please describe how PTI is practically organised with respect to the testing of vehicles, the roles and interactions between stakeholders including the information flow and core practical processes.

This question will enable the European Commission to have an overview of the current national organisation and information flows concerning PTI.

Please explain PTI organisation:

3.1.3 Periodic Technical Inspection in figures: How many inspection stations are currently performing PTI in your country, how many vehicles are inspected every year at national level? Among them, how many vehicles registered in another MS are inspected every year?

Total number of inspection stations:

Total number of inspected vehicles / year:

Total number of inspected vehicles registered in another MS / year:

Additional comment:

3.1.4 How is Road Side Inspection (RSI) organised in your MS? Please describe how RSI is practically organised, with respect to the road side inspection of vehicles, roles and interactions between stakeholders including information flow.

This question will enable the European Commission to have an overview of the current national organisation and information flow concerning RSI.

Please explain RSI organisation:

3.1.5 Road Side Inspection in figures: How many vehicles undergo roadside inspections every year? Among them, how many vehicles registered in another MS are inspected every year?

Total number of inspected vehicles / year:

Total number of inspected vehicles registered in another MS / year:

Additional comment:

3.2 The current exchange of vehicle information data

Objective: Allows the European Commission to understand the organisation of the national registers/systems of vehicle information and data information exchange in relation with the current business processes in place. Also, this section allows the European Commission to identify future needs in respect of the VIP.

3.2.1 Please list in the table below all vehicle information registers/systems currently in use (electronic and non-electronic), please indicate which are used for international exchange of data.

Register/system name	Owner	Register/system content	Electronic (y/n)	International exchange (y/n)	Usage, functionalities

Table 2: List of registers/systems related to vehicle information data

Additional comment:

3.2.2 In order to have an overview of vehicle data exchange <u>at national level</u>, please describe the data flow between the different registers/systems and stakeholders[1]. If possible, please provide a figure.

Please explain:

3.2.3 In order to have an overview of vehicle data exchange <u>at international level</u>, please describe the data flow between the different registers/systems and stakeholders. If possible, please provide a figure.

Please explain:

[1] Please ensure that the stakeholders and systems are listed in answers to questions 3.1.1 and 3.2.1.

3.2.4 What are currently the main practical problems encountered with respect to transmitting vehicle information to competent authorities and stakeholders (such as vehicle manufacturers) from other MS? Would there be more than 1 problem, please prioritize the impact (1: High, 2: Medium, 3: Low).

Practical problem	Impact (1: high, 2 medium, 3: low)
No formal vehicle information exchange model is defined at EU level	
Bilateral agreements not available or EU regulation not in place	
Lack of vehicle information data	
National vehicle information is not centralised	
Technical issues	
Budgetary issues	
Other: please specify	

Table 3: List of practical problems encountered in data exchange

3.3 Legal context

This section aims to provide information on legal requirements and relevant legal obligations.

3.3.1 What is the national legislation related to PTI and RSI which are completely or partially dedicated to the collection of vehicle information in your country (please provide a copy, if available in English)?

Please enlist and describe the legal framework for vehicle information shortly:

3.3.2 Do personal data privacy-, personal data protection requirements or any other sensitive data protection and data disclosure requirements exist with respect to PTI and RSI vehicle information data in your country? Please complete the table below.

	Personal data	Other sensitive data
Minimum and maximum duration of data storage	Minimum duration: Maximum duration: Additional comment:	Minimum duration: Maximum duration: Additional comment:
Data disclosure obligations:	Please explain:	Please explain:
Data usage restrictions:	Please explain:	Please explain:

Table 4: Data privacy and data protection requirements

3.3.3 Is there a legal obligation in your country for vehicle manufacturers to provide access to technical information necessary for roadworthiness tests (PTI and RSI)?

Please explain:

3.3.4 Has your country signed up to any bilateral or multilateral agreements with other EU Member States with provisions on the trans-national exchange of PTI and RSI vehicle information?

If yes, please indicate their name of the agreement and date of signature and provide further details on their most important stipulations, including the MS involved.

Please explain:

3.3.5 Are there any stipulations in your national law limiting the trans-national exchange of PTI and RSI vehicle information?

If yes, please provide further details:

4 THE FUTURE NEEDS

4.1.1 If you would have to choose a single national connection point with the VIP, which national system would it be? If a single connection point is not an acceptable option then please describe why.

Please explain:

4.1.2 Can it be assumed that the preferred authorisation process for accessing VIP is based on a national authorisation process? If not then please explain.

☐ Yes
☐ No: please explain:

4.1.3 In respect of the implementation of the VIP in the scope of the new Roadworthiness package, is there any need for the following:

a. additional national vehicle information register(s)/system(s)

☐ None
☐ Yes: please specify:
Please explain:

b. additional national vehicle information data in existing register(s)/system(s)

☐ None
☐ Yes: please specify:
Please explain:

c. additional vehicle information data exchange at national level (between national registers/systems)

☐ None
☐ Yes: please specify:
Please explain:

d. additional vehicle information data exchange at EU level (with other MS registers/systems)

☐ None
☐ Yes: please specify:
Please explain:

e. Other:

☐ None
☐ Yes: please specify:
Please explain:

4.1.4 Are the national authorities in the position to exchange PTI and RSI national vehicle information data with the following competent authorities from other MS? Under which conditions? What are the benefits?

a. Approval authority

☐ No: please explain
☐ Yes:
Please specify the conditions:
Please specify the benefits:

b. Registration authority

☐ No: please explain
☐ Yes:
Please specify the conditions:
Please specify the benefits:

c. Periodic Technical Inspection responsible authority

☐ No: please explain
☐ Yes:
Please specify the conditions:
Please specify the benefits:

d. Road Side Inspection responsible authority

☐ No: please explain
☐ Yes:
Please specify the conditions:
Please specify the benefits:

e. Other:

☐ No: please explain
☐ Yes:
Please specify the conditions:
Please specify the benefits:

4.1.5 Would you have specific requirements or suggestions for guidelines regarding the Vehicle Information Platform?

Please explain:

5 OTHER

5.1.1 Do you have an ISDN video conference system available which could be used for a possible interview?

☐ No
☐ Yes

Additional comment:

6 TERMINOLOGY

6.1 Acronyms & Abbreviations

Acronym or Abbreviation	Meaning
DG MOVE	European Commission Directorate-General for Mobility and Transport
EU	European Union
ISDN	Integrated Services for Digital Network
MS	Member State
PTI	Periodic Technical Inspection
RSI	Road Side Inspection
RW	Roadworthiness
TI	Technical Inspection
VIP	Vehicle Information Platform

Table 5: Acronyms & Abbreviations

*** End of MOVE-VIP-QST-001

8.6.1.2 Register Overview

DG MOVE
Unit C4: Road Safety

Project: Vehicle Information Platform

Questionnaire for the feasibility study of a European Vehicle Information Platform - Register Overview

Country report <*Country name*>

Authority report <*Authority name*>

(MOVE-VIP-QST-001)

Abstract

In the scope of the Vehicle Information Platform feasibility study, this questionnaire has the objective to collect all necessary information on one of the registers involved in the national Periodic Technical Inspection and Road Side Inspection processes.

Document information

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Contents

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The study also identified two root causes of the high level of technical defects:

- The scope of the current EU legislation is too narrow and the level of requirements it sets is too low
- Concerned actors don't exchange information and vital data for effective tests and test results enforcement

In order to increase road safety, the EU decided to update current roadworthiness regulations in order to take the vehicle's technological evolution into account and to enable the implementation of a vehicle information data exchange platform. The purpose of this system is to exchange technical information related to the vehicles only.

The updated regulation proposal specifies that member states (MS) competent authority shall exchange data. This updated regulation will support the data-exchange platform. One of the objectives aims towards a more harmonised Periodic Technical Inspection process throughout the EU.

An important aspect of this new regulation foresees that vehicle manufacturers shall provide Periodic Technical Inspection (PTI) centres or National Authorities with the necessary technical information for roadworthiness testing.

Article 15 of the new Regulation proposal on periodic roadworthiness tests requires the Commission to examine the feasibility, costs and benefits of the implementation of an electronic Vehicle Information Platform (VIP).

The objective of this platform VIP is to enable competent authorities of MS, roadworthiness test centers and vehicle manufacturers to exchange technical information related to vehicle approval, vehicle registration and vehicle testing.

2 CONTEXT OF THE PRESENT STUDY

In June 2013, the Commission contracted Unisys Belgium to conduct the feasibility study of a Vehicle Information Platform. The study includes desk-based research and interviews with different stakeholders in MS. These last are conducted in a two-step process:

- E-mail questionnaires sent to stakeholders of MS for collecting general and specific background information on Vehicle information.
- Possible face-to-face interviews with stakeholders in MS to understand the different perspectives and gather more in-detail information where needed.

The key objective of this questionnaire is to gather information about your national organization and systems dealing with roadworthiness processes, focusing on data exchange with other MS.

This Questionnaire offers you the chance to provide the European Commission with more insights on your current organisation. Moreover, it offers you the possibility to clarify and communicate your needs and priorities in this domain.

2.1 About the questionnaire

This questionnaire aims to provide more information on the current register which has been identified as being part of the existing vehicle information registers of your MS. The objective of this questionnaire is to gain more detailed information on the system and the data exchanged.

Future needs and suggestions linked to the Vehicle Information Platform are also addressed

The European Commission requests to have this questionnaire filled in and sent back 3 working weeks after reception.

This questionnaire is the complement of another questionnaire that has been addressed at national level with the objective of understanding the current national organisation in terms of Vehicle Approval, Vehicle Registration, Periodic Technical Inspection (PTI) and Road Side Inspection (RSI).

2.2 How to complete this questionnaire

To help you answering the questionnaire, we have settled different kind of questions; open questions, checks boxes, and tables to be filled in. Editable paragraphs/fields where you can provide your answers are highlighted.

Some questions give you the opportunity to provide comments or to give more explanation.

When answering the questions, please keep in mind that the purpose is to gain a clear understanding and overview on the register concerning data, functionalities and communication channels at national and EU level.

Additionally, the questions give you the opportunity to provide your comments and suggestions on vehicle information exchange with other MS.

2.3 Important notice

For further enquiries regarding the project in general or this questionnaire, do not hesitate to send an e-mail to the following e-mailbox: VIPstudy@unisys.com.

2.4 Guarantee of Confidentiality

This individual questionnaires will be disclosed "as-is" to the European Commission, but not "as-is" to any other party. However the findings will be consolidated in a general overview or in comparative tables for the purpose of study or trend analysis.

Personal information concerning contact names is needed for further contacts. This information will not be disclosed "as-is" to any party and will only be used by the European Commission in the scope of the study.

3 SPECIFIC INFORMATION ABOUT THE REGISTER <REGISTER NAME>

3.1 Register identification and overview

3.1.1 Please fill in information about the person replying to the questionnaire

This information is needed for the European Commission to have a contact name in case they would need clarifications on the responses.

Surname:

Name:

Email:

Phone (with international prefix):

Organization:

Function:

Surname:

Name:

Email:

Phone (with international prefix):

Organization:

Function:

3.1.2 Please complete the following register identification information:

Please ensure that the register name is also enlisted in the table 1 from the "Vehicle Information - Country Overview" questionnaire.

Register name:

Register owner:

Register objectives:

3.1.3 What business goals are supported by the register/system?

Please explain:

3.1.4 For what categories of vehicles does the system contain information, since when and what is the data retention period? Please fill in the following table.

Vehicle category	Data stored (Y/N)	Since When (DD-MMM-YY)	Data retention period (months)
M Motor vehicles with at least four wheels designed and constructed for the carriage of passengers			
N Motor vehicles with at least four wheels designed and constructed for the carriage of goods			
O Trailers (including semi-trailers)			
L Mopeds, motorcycles, tricycles and quadricycles			
T Agricultural and forestry tractors			

Table 1: System vehicle data storage information

3.1.5 Does the system handle personal data?

Please explain:

3.1.6 Does the system link personal data with vehicle information?

☐ No
☐ Yes, by which field are those data linked?
Please explain:

3.1.7 Does the system contain information about vehicles registered in other MS?

☐ No
☐ Yes, which data elements are stored?
Please explain:

3.1.8 What evolutions have been already planned concerning the collection and exchange of vehicle information data?

Please specify:

3.1.9 Does the system currently exchange vehicle information data with registers/systems from other MS?

Please identify the register/system names and the MS.

Register/system name	MS (please enlist if needed)

Table 2: System's international exchanges

Additional comment:

3.2 System data

3.2.1 In order to understand which vehicle information data the register currently exchanges, please identify the kind of information that is exchanged for the business processes enlisted in the table below. In order to understand the future needs, please identify and prioritize the need for the business process.

The objective is to collect detailed information on the current information exchanged between the registers and understand future needs in terms of data exchange.

For each identified business process in the following table, please specify whether specific functionality is already available in the system at the national level.

- If yes, please specify
  - The kind of information exchanged: more detail on information will be asked in the following question
  - The name(s) of the other register(s) system(s) exchanging the information with the register the document is about
- If no – please assign priority according to needs: 1: absolute necessity, 2: nice to have, 3: not needed.

Business process	Currently available (Y/N)	Information exchanged	Register/System name	Priority of the future needs (1-3)
1. VEHICLE IDENTIFICATION FUNCTIONALITIES				
1.1. Verify Certificate of Conformity with national register	*i.e: Y*	*i.e: VIN nr, CoC*	*National Type approval register EU type approval register*	*1*
1.2. Verify Registration document with national register				
1.3. Verify previous registration data with relevant national register				
1.4. Check for duplicates based on:				
1.4.1. License plate nr				
1.4.2. VIN				
1.4.3. Others, please specify:				
1.5. Others, please specify				
2. PTI FUNCTIONALITIES				
2.1. Verify reasons and results of previous PTI, date and place PTI was performed				
2.2. Verify previous recorded value of the odometer				
2.3. Obtain relevant technical information of a vehicle based on the VIN in order to perform the test for the following inspection areas:				
2.3.1. Braking equipment				
2.3.2. Steering				
2.3.3. Visibility				
2.3.4. Lighting equipment and parts of electric system				
2.3.5. Axles, wheels, tyres, suspension				
2.3.6. Chassis and chassis attachments				

Business process	Currently available (Y/N)	Information exchanged	Register/System name	Priority of the future needs (1-3)
2.3.7. Supplementary tests for passenger carrying vehicles				
2.3.8. Other equipment, please specify				
2.3.9. Nuisance (noise and emissions)				
2.3.10. Electronic Controlled safety Systems (ECSS):				
2.3.10.1. Electronic Stability Control (ESC)				
2.3.10.2. Anti-lock Braking System (ABS)				
2.3.10.3. Electronic Braking System (EBS)				
2.3.10.4. Electronic Power Steering (EPS)				
2.3.10.5. Emergency Brake Assist (EBA)				
2.3.10.6. Supplemental Restraint Systems (SRS)				
2.3.10.7. Safety Belt Load Limiter				
2.3.10.8. Safety Belt Pretensioner				
2.3.10.9. Airbag				
2.3.11. Speed control				
2.3.12. Tyres calibration parameter for Tachograph				
2.4. Issue PTI certificate and store it				
2.5. Send PTI certificate to National Authority				
2.6. Others, please specify				
2.7. Others, please specify				

Business process	Currently available (Y/N)	Information exchanged	Register/System name	Priority of the future needs (1-3)
3. ROAD SIDE INSPECTION FUNCTIONALITIES				
3.1. Check risk score for a transport undertaking operator				
3.2. Verify results from previous RSI, date and place RSI was performed				
3.3. Issue RSI report and store it				
3.4. Send RSI report to relevant National Authority				
3.5. Send RSI report to other MS				
3.6. Others, please specify				
4. REPORTS AND STATISTICS				
4.1. Send reports and statistics to EU institutions				
4.2. Send statistics for quality checks to the supervising authority				
4.3. Send reports and statistics for accident research and policy making				
4.4. Others, please specify				
5. OTHER FUNCTIONALITIES (PLEASE ADD AS MANY ROWS AS NEEDED)				
5.1. Please specify:				
5.2. Please specify:				

Table 3: System functionalities and future needs

Additional comment:

3.2.2 For each kind of information specified in the previous table, please describe the details on the content of the information concerned.

The objective is to gather details on data currently exchanged with this register and future needs. Please fill in the table as following:

- Information exchanged: refer to the 'information exchanged' from the previous table
- Detailed information data: please specify detailed information data concerning the information exchanged
- Currently available: please identify if the information is currently available
- Future need:
  - Y: if the current information is still needed, or a missing information is needed in the future. In that case, please identify the detailed information needed.
  - N: This information is not needed in the future.

Please note that data filled in below is an example only.

Information exchanged	Detailed information data	Currently available (Y/N)	Future need (Y/N)
Example: CoC			
	VIN number	*Y*	*Y*
	Category	*Y*	*Y*
	Make	*N*	*Y*
	EC type-approval number	*N*	*Y*

Table 4: Exchanged information description

Additional comment:

3.2.3 Can you please provide the data dictionary of the system? If possible, please provide a copy in English.

Additional comment:

3.2.4 Is the system using standard codes (dictionaries) for specific types of fields? Please fill in the table below:

Standard codes (dictionaries)	Types of fields concerned
Example	

Table 5: System standard codes

Additional comments:

3.2.5 If the system has an indexing server, what data are indexed?

- ☐ Personal data
- ☐ Vehicle Identification Number
- ☐ Vehicle Registration Number
- ☐ PTI last inspection date
- ☐ Other, please specify:

3.2.6 What data security mechanism(s) is/are implemented on the systems (data at rest)?

- ☐ Encryption
- ☐ Signature with digital certificate
- ☐ Authentication with digital certificate
- ☐ Hashing
- ☐ Access Control (please specify method used):
- ☐ Other, please specify:

3.3 Information exchange

3.3.1 In respect of the new regulation proposal, what are the requested conditions to be met in order to exchange additional PTI and RSI information?

Please explain:

3.3.2 Does the system currently exchange vehicle information data with registers/systems from other MS?

Please identify the register/system names and the MS.

Register/system name	MS (please enlist if needed)

Table 6: List of registers from other MS exchanging data.

3.3.3 To what type of network is the system currently connected?

- ☐ Internet
- ☐ National Administration network (please specify)
- ☐ sTESTA
- ☐ Intranet
- ☐ Other, please specify:

3.3.4 If the current system exchanges data with other systems, what are the channels of communication and security implemented? Please select all that apply.

	Present	Current channel		Preferred channel with VIP	
	(Y/N)	Encryption (Y/N)	Signature (Y/N)	Encryption (Y/N)	Signature (Y/N)
HTTP/HTTPS					
Web-services					
FTP/FTPS					
e-mail					
Other: please specify					

Table 7: System communication channels description

Additional comment:

3.3.5 If the current system exchanges data with other systems (including import and export), what are the formats exchanged and security implemented? Please select all that apply.

	Current format		Preferred format with VIP	
	Encryption (Y/N)	Signature (Y/N)	Encryption (Y/N)	Signature (Y/N)
JSON				
XML				
Photos, what format is used? Please specify:				
Scanned documents, what format is used? Please specify:				
PDF				
Csv				
Excel files				
Other: please specify				

Table 8: System data format exchange

Additional comment:

3.3.6 Concerning data exchange, what data security mechanism(s) is/are implemented on the system?

- ☐ Encryption
- ☐ Signature with digital certificate
- ☐ Encrypted channel
- ☐ Other, please specify:

3.4 System usage statistics

3.4.1 How many vehicle information records does the system contain? What is the expected annual increase (# records/year)?

Please specify:

3.4.2 How many single users are currently using the system?

Please specify:

3.4.3 How many searches and create/update/delete operations are executed by the system per year? What is the yearly growth of those operations? Please fill in the table below.

	Search operations	Create/update/delete operations
Yearly number of operations		
Yearly expected growth		
Maximum acceptable number of operations without change of Service Level Agreements		

Table 9: System's operations description

Additional comments:

3.5 Service Level Agreement (SLA)

3.5.1 What are the SLA's applicable to the system?

Please complete the following table:

SLA	Value
Maximum Response time (seconds)	
Availability (percentage / year)	
Maintenance: • Defined maintenance window • Mean time to repair (MTTR)	 • •
System performance • Minimum number of transactions/second • Maximum number of transactions/second	 • •
Other, please specify	

Table 10: System SLA

Additional comments:

3.6 System costs

3.6.1 What are the overall costs of the system? Please complete the following table:

Type of costs	Amount (Mio €)
Yearly budget for operations	
Yearly budget maintenance	
Yearly budget foreseen for further development	

Table 11: System costs

Additional comments:

4 TERMINOLOGY

4.1 Acronyms & Abbreviations

Acronym or Abbreviation	Meaning
COC	Certification of Conformity
DG MOVE	European Commission Directorate-General for Mobility and Transport
EU	European Union
MS	Member State
MTTR	Mean Time to Repair
PTI	Periodic Technical Inspection
RSI	Road Side Inspection
SLA	Service Legal Agreement
sTESTA	Secure Trans European Services for Telematics between Administrations
VIP	Vehicle Information Platform

Table 12: Acronyms & Abbreviations

*** End of MOVE-VIP-QST-001

8.6.2 Interview Guide

DG MOVE
Unit C4: Road Safety
Contract: MOVE/C4/SER/2012-325-1/SI2.653615

Project: Vehicle Information Platform

VIP Interview guide
Country: MS - MS name

(MOVE-VIP-IG-xxx)

Abstract

This document is the basis for the meeting with MS and stakeholders in the scope of the Vehicle Information Platform feasibility study. It serves as a basis for discussions and will be updated with the meeting notes. The final version is considered to be the meeting report.

Document information

AUTHOR	Unisys
OWNER	European Commission DG Mobility and Transport
ISSUE DATE	DD/MM/2014
VERSION	0.10
APPROVAL STATUS	Meeting preparation

Document History

VER	DATE	AUTHOR	DESCRIPTION	ACTION*	PG
0.10	dd/mm/2014	XXX	Initial draft	*	*
				*	*
				*	*
				*	*

Action: I = Insert, R = Replace

Contents

1 INTRODUCTION

1.1 Background

In the scope of the Vehicle Information Platform feasibility study, Unisys project team visits you in order to get clarification and deeper information on your current national organisation and future expectations. Based on the answers you provided in the questionnaire, this document lists the topics we would like to discuss with you.

1.2 How to use this Interview Guide

This Interview Guide will be used as a support for the meetings taking place in the Member States. It will ensure that all key issues are addressed systematically in order to guarantee the comparability of the results across the Member States.

It can be used by the participants to prepare for the meeting, to gather relevant documentation or to organise preparatory meetings with the relevant experts. The outcome of such preparatory discussions should be used to pre-fill this interview guide prior to the meeting. It will be used by the Consultants during the meeting itself as an information collection tool.

It also contains a standard structure for the meeting agenda. This can however be adjusted on an ad-hoc basis upon suggestion from the Single Point of Contact. He or she has a better understanding of the national context and can ensure the project takes national specificities into consideration.

1.3 Permission for information sharing

☐ The Member State agrees that the completed Interview Guide can be shared with the project team (Please tick the box to indicate agreement).

2 OVERVIEW OF THE MEETING

2.1 Meeting identification, attendees.

Subject of the meeting:	*VIP feasibility study*
Location of the meeting:	*Location of the meeting*
Date of the meeting:	dd/mm/2014

Attendees			
Name	**Function**	**Institution/ Company**	**e-mail address**

2.2 Meeting agenda

1. *Introduction and presentation of the study (by Unisys team)*
2. *Presentation of PTI and RSI organisation in <MS> (by <MS> representatives)*
3. *Review of the questionnaire findings*
4. *Discussion on the suggestions for a Vehicle Information Platform (VIP)*

3 MEETING REPORT.

3.1 Introduction and presentation of the study (UIS)

Suggested duration: 15 min

The study team members provide an overview of the study context, objectives and the expected outcome. The project team, the planning of the project and its current status are presented to the meeting participants.

Notes on the presentation:

3.2 Presentation of PTI and RSI current organisation in MS - MS name

Suggested duration: 30 min

Member States' experts are requested to prepare a presentation that provides an overview of the current PTI and RSI business processes in their country. It is a good occasion to highlight particular concerns or good practices at national level regarding the exchange of vehicle information data related to PTI and RSI.

To the extent possible, this presentation will also address the requests for additional information on the Questionnaire enlisted below (boxes are available below each question to provide clarifications):

Notes on the presentation:

3.3 Review of the questionnaire findings

Additional questions have been identified in the questionnaire. These are highlighted in the following document. We will go through these questions during the meeting.

Country Overview: <Questionnaire file name>

- *Question x.y.z*
- *Question x.y.z*
- *Question*

<Insert here the document>

Register overview:

3.4 Discussion on the suggestions for a Vehicle Information Platform (VIP)

As a second step, a more detailed analysis will be undertaken in order to receive Member States' opinion on the following specific issues:

1. **Do you currently exchange information with the following systems: TACHONET, RESPER and ERRU? Could you please provide us with an overview of this data exchange (which systems are connected, how are they connected)?**

Answer:

2. **Based on the new RW package, we identified the necessity of having access to all necessary technical information for each single vehicle in order to test electronically controlled systems, like Electronically Controlled Security Systems (ECSS).**

   What would be your suggestion for the communication with vehicle manufacturers and data storage in this scope?

Answer:

3. **The agreed text of the new RW package mentions the '*collection and storage of information available concerning the main safety related components of vehicles which have been involved in serious accidents, as well as the possibility to render, in anonymised form, information on accident history and odometer readings available to inspectors, holder of registration and accident researchers*'.**

   Are you actually in a position to provide these data? What would be the needs in order to be in a position to exchange these data with other MS?

Answer:

4. **Any other question, point to discuss or share?**

Answer:

4 MEETING SUMMARY AND CONCLUSIONS

The meeting will be finalised by drawing the key points and summarising the main findings.
Key points and findings:

*** End of MOVE-VIP-IG-xxx ***

8.7 Contact list

The following table provide the list of contact names for each Member State and main stakeholders.

Member States / Stakeholder	Contact name
AT	Franz Wurst
BE	Martine Indot
BG	-
CY	-
CZ	-
DE	Bodo Bronnmann
DK	-
EE	Kaspar Lood
EL	-
ES	Luis Fernando Velasco
FI	Erik Asplund
FR	Cathy Bieth
HR	Tomislav Škreblin
HU	Emese Vida
IE	Veronica Rowland
IT	Antonio Erario
LT	Dmitrij Bial
LU	Camille Gonderinger
LV	Juris Puntaks
MT	Lino Abela
NL	Servi Beckers
PL	Dorota Cabansak
PT	-
RO	Cristian Uta
SE	Eva Jacino
SI	Tomaž Svetina, M.Sc.
SK	Marek Hudek
UK	Aidan Naughton
CITA	Wim Labro
EGEA	Neil Pattemore
ACEA	Erwin Kirschner
EReg	Hans Van Der Bruggen
Car-Pass	Michel Peelman

Table 8-4: VIP list of contact names

8.8 Findings on Member States view

This section presents series of tables summarising findings regarding current situation at Member States. For brevity some acronyms were used in these tables, they should be interpreted as follows:

Y – yes
N – no
n/a – answers were not provided

8.8.1 MS participation to the study

Below table presents the MS participation in providing input to this study:

SPOC identification: process status of identification and nomination of a single point of contact (SPOC) for each MS. Some MS did not appoint SPOC for this study.

Questionnaires – two questionnaires were sent to the SPOCs. Responses from some MS were not received.

Interviews – after reception of answers to questionnaires, interviews were organised with MS representatives. Interviews were held during visits to Member States (mission) or during on-line meetings.

MS	Questionnaires		Interviews		Comment
	Country overview	Register Overview	Type	Status	
AT	Completed	Completed	On-line	Completed	Completed
BE	Completed	Completed	Mission	Completed	QST received late, no formal interview
BG	-	-	-	-	No SPOC
CY	-	-	-	-	No SPOC
CZ	-	-	-	-	No SPOC
DE	Completed	Completed	On-line	Completed	QST received late, no formal interview
DK	-	-	-	-	Denied
EE	Completed	Completed	Mission	Completed	Completed
EL	-	-	-	-	No SPOC
ES	Completed	Completed	Mission	Completed	Completed
FI	Completed	Completed	Mission	Completed	Completed
FR	Completed	Completed	On-line	Completed	Interview partially completed
HR	Completed	Completed	On-line	Completed	Completed
HU	Completed	Completed	Mission	Completed	Completed
IE	Completed	Completed	On-line	Completed	Completed
IT	Completed	Completed	On-line	Completed	Completed
LT	Completed	Completed	Mission	Completed	Completed
LU	Completed	Completed	Mission	Completed	Completed
LV	Completed	Completed	On-line	Completed	Completed
MT	Completed	Sent to MS	On-line	Not started	Missing QST
NL	Completed	Completed	Mission	Completed	Completed
PL	Completed	Completed	Mission	Completed	Completed
PT	-	-	-	-	No SPOC
RO	Completed	Completed	On-line	Completed	Completed
SE	Completed	Completed	Mission	Completed	Completed
SI	Completed	Sent to MS	On-line	Not started	Missing QST

MS	Questionnaires		Interviews		Comment
	Country overview	Register Overview	Type	Status	
SK	Completed	Sent to MS	On-line	Not started	Missing QST
UK	Completed	Completed	Mission	Completed	Completed

Table 8-5: Detailed MS participation to the feasibility study

8.8.2 Centralised Databases

Below table presents the presence of centralised database for registration, PTI and RSI data among the participating Member States.

MS	Presence of centralised database		
	Registration	PTI	RSI
AT	Y	Y	Y
BE	Y	Y	Y
BG	n/a	n/a	n/a
CY	n/a	n/a	n/a
CZ	n/a	n/a	n/a
DE	Y	Y	N
DK	n/a	n/a	n/a
EE	Y	Y	Y
EL	n/a	n/a	n/a
ES	Y	Y	N
FI	Y	Y	N
FR	Y	Y	n/a
HR	Y	Y	Y
HU	Y	Y	N
IE	Y	Y	Y
IT	Y	Y	Y
LT	Y	Y	Y
LU	Y	Y	N
LV	Y	Y	Y
MT	n/a	n/a	n/a
NL	Y	Y	Y
PL	Y	N	N
PT	n/a	n/a	n/a
RO	Y	Y	Y
SE	Y	Y	Y
SI	n/a	n/a	n/a
SK	n/a	n/a	n/a
UK	Y	Y	Y
Total for interviewed MS	**100%**	**95%**	**63%**
Total for all MS	**68%**	**64%**	**43%**

Table 8-6: MS Centralised databases

8.8.3 Registration related information

Below table presents which vehicle categories are covered by the registration database and whether CoC is stored in centralised database or not. Some Member States plan to have it available in the future. Planned year is indicated in parenthesis.

MS	Data available					
	Registration document for vehicle categories					CoC
	M	N	O	L	T	
AT	Y	Y	Y	Y	Y	Y
BE	Y	Y	Y	Y	Y	Y
BG	n/a	n/a	n/a	n/a	n/a	n/a
CY	n/a	n/a	n/a	n/a	n/a	n/a
CZ	n/a	n/a	n/a	n/a	n/a	n/a
DE	Y	Y	Y	Y	Y	Y
DK	n/a	n/a	n/a	n/a	n/a	n/a
EE	Y	Y	Y	Y	Y	N
EL	n/a	n/a	n/a	n/a	n/a	n/a
ES	Y	Y	Y	Y	Y	Y
FI	Y	Y	Y	Y	Y	Y
FR	Y	Y	Y	N	N	N
HR	Y	Y	Y	Y	Y	Y
HU	Y	Y	Y	Y	Y	N
IE	Y	Y	Y	Y	Y	Y
IT	Y	Y	Y	Y	Y	Y (2016)
LT	Y	Y	Y	Y	N	Y (2014)
LU	Y	Y	Y	Y	Y	Y
LV	Y	Y	Y	Y	N	Y
MT	n/a	n/a	n/a	n/a	n/a	n/a
NL	Y	Y	Y	Y	N	Y
PL	Y	Y	Y	Y	Y	N
PT	n/a	n/a	n/a	n/a	n/a	n/a
RO	Y	Y	Y	Y	Y	N
SE	Y	Y	Y	Y	Y	Y
SI	n/a	n/a	n/a	n/a	n/a	n/a
SK	n/a	n/a	n/a	n/a	n/a	n/a
UK	Y	Y	Y	Y	N	Y
Total for interviewed MS	**100%**	**100%**	**100%**	**95%**	**74%**	**74%**
Total for all MS	**68%**	**68%**	**68%**	**64%**	**50%**	**50%**

Table 8-7: MS registration information

8.8.4 PTI related information

Below table presents counts of inspected vehicles, PTI stations and availability of the RW certificate in the centralised database.

MS	PTI		Data available
	#inspection stations	#inspected vehicles	RW certificate
AT	7,000	5,000,000	Y
BE	77	4,667,824	Y
BG	n/a	n/a	n/a
CY	n/a	n/a	n/a
CZ	n/a	n/a	n/a
DE	28	27,000,000	Y
EL	n/a	n/a	n/a
EE	102	416 000	Y
EL	n/a	n/a	n/a
ES	470	16,000,000	Y
FI	401	2 667 939	Y
FR	6,500	24,000,000	Y
HR	160	1,870,301	Y
HU	1,300	1,800,000	Y
IE	197	1,170,899	Y
IT	7,703	16,691,666	Y
LT	67	800,000	Y
LU	3	380,591	Y
LV	33	955,195	Y
MT	n/a	n/a	n/a
NL	10,311	6,815,289	Y
PL	n/a	n/a	Y
PT	n/a	n/a	n/a
RO	1,623	2,080,249	Y
SE	314	5,979,440	Y
SI	n/a	n/a	n/a
SK	n/a	n/a	n/a
UK	22,500	27,000,000	Y
Total for interviewed MS	**58,789**	**142,211,454**	**100%**
Total for all MS	**58,789**	**142,211,454**	**68%**

Table 8-8: MS PTI information

8.8.5 RSI related information summary

Below table presents count of inspected vehicles, count of inspected vehicles registered in other MS and the presence of RSI report in the centralised database.

MS	RSI		Data available
	Total # of inspected vehicles	# of inspected vehicles registered in another MS	RSI report
AT	32,046	10,291	Y
BE	9,499	6,357	Y
BG	n/a	n/a	n/a
CY	n/a	n/a	n/a
CZ	n/a	n/a	n/a
DE	1,144,961	604,066	N
DK	n/a	n/a	n/a
EE	850	9	Y
EL	n/a	n/a	n/a
ES	n/a	n/a	N
FI	8,204	975	N
FR	n/a	n/a	n/a
HR	27,159	6,534	Y
HU	180,000	60000-70000	N
IE	145,000	n/a	Y
IT	n/a	n/a	Y
LT	37,128	12,166	Y
LU	384	311	N
LV	3,045	862	Y
MT	n/a	n/a	n/a
NL	4,655	1,684	Y
PL	n/a	n/a	N
PT	n/a	n/a	n/a
RO	1,895	98	Y
SE	20,000	3,500	Y
SI	n/a	n/a	n/a
SK	n/a	n/a	n/a
UK	167,339	66,334	Y
Total for interviewed MS	**1,782,165**	**713,187**	**63%**
Total for all MS	**1,782,165**	**713,187**	**43%**

Table 8-9: Detailed MS roadside inspection related information

8.8.6 Accident data availability

This table presents the availability of accidents data in a centralised database. In some cases it is only planned to be available in future therefore the year by which this is planned is provided in parenthesis.

MS	Data availability
	Accident data
AT	N
BE	n/a
BG	n/a
CY	n/a
CZ	n/a
DE	Y
DK	n/a
EE	Y
EL	n/a
ES	n/a
FI	N
FR	n/a
HR	N
HU	n/a
IE	Y
IT	Y (2016)
LT	Y (partially)
LU	Y
LV	N
MT	n/a
NL	Y
PL	N
PT	n/a
RO	N
SE	N
SI	n/a
SK	n/a
UK	N
Total for interviewed MS	**37%**
Total for all MS	**25%**

Table 8-10: Detailed MS data availability in centralised systems

8.8.7 Personal and sensitive data

The table below table presents Member States' assessment on the presence of sensitive and personal data in their registers. The following acronyms are used: S – sensitive data, P – personal data, Blanks – data is not considered sensitive or personal, n/a – no answers was provided

MS	Data sensitivity From MS questionnaires					Data sensitivity From RW package data entities info	
	License plate	VIN	VIN / Make	VIN/ License plate/ first registration date	Odometer reading	Driver name	Officer or inspector having carried out the inspection
AT		S	S			P	P
BE	S	S				P	P
BG	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CY	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CZ	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DE	S	S				P	P
DK	n/a	n/a	n/a	n/a	n/a	n/a	n/a
EE	n/a	n/a				P	P
EL	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ES	n/a	n/a				P	P
FI	S	S				P	P
FR	P	S				P	P
HR	S	S				P	P
HU	S	S				P	P
IE	S				P	P	P
IT	n/a	n/a				P	P
LT	P					P	P
LU		S				P	P
LV	S					P	P
MT	n/a	n/a	n/a	n/a	n/a	n/a	n/a
NL	S	S				P	P
PL				S		P	P
PT	n/a	n/a	n/a	n/a	n/a	n/a	n/a
RO	S	S				P	P
SE	N	N				P	P
SI	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SK	n/a	n/a	n/a	n/a	n/a	n/a	n/a
UK	n/a	n/a				P	P
% S	**32%**	**36%**	**4%**	**4%**	**0%**	**0%**	**0%**
% P	**7%**	**0%**	**0%**	**0%**	**4%**	**68%**	**68%**
% n/a	**46%**	**46%**	**32%**	**32%**	**32%**	**32%**	**32%**

Table 8-11: Detailed MS data sensitivity

8.8.8 Main practical problems encountered

Below table presents summary of main practical problems (in columns) for vehicle information exchange encountered by MS. Higher value means higher problem.

MS	No formal vehicle information exchange model is defined at EU level	Bilateral agreements not available or EU regulation not in place	Lack of vehicle information data	National vehicle information is not centralised	Technical issues	Budgetary issues	Other	Other comment
AT	2			3			1	Lack of information about registration and de-registration in other Member States.
BE	2	1	1	3	2	1		Lack of CoC data exchanged.
BG	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CY	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CZ	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DE	3							No practical problems occur. EUCARIS and ETAES provide sufficient platforms for Vehicle data exchange. Therefore it would be helpful if European legislation would refer to them as the systems used for exchanging vehicle data.

MS	No formal vehicle information exchange model is defined at EU level	Bilateral agreements not available or EU regulation not in place	Lack of vehicle information data	National vehicle information is not centralised	Technical issues	Budgetary issues	Other	Other comment
DK	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
EE	1	1	1	2				
EL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ES	1	1	2			2		
FI	1				3	2		
FR	1							
HR								
HU	2	1	3		1			
IE								
IT	3	1	3	1	3	3		
LT	1	1	1	3	2	1		
LU	1	2	3		3	3		
LV								
MT	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
NL		1	1		3			Use existing platform EUCARIS for exchange between Registration Authorities (NCP's) of technical vehicle information and inspection results.
PL	1				3	1	1	Legal issues

MS	No formal vehicle information exchange model is defined at EU level	Bilateral agreements not available or EU regulation not in place	Lack of vehicle information data	National vehicle information is not centralised	Technical issues	Budgetary issues	Other	Other comment
PT	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
RO	3	3	2	3	3	1		
SE	3							
SI	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SK	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
UK								
% responses	**50%**	**32%**	**32%**	**21%**	**32%**	**29%**		
Average value	**1.79**	**1.33**	**1.89**	**2.50**	**2.56**	**1.75**		
Average meaning	**medium**	**high**	**medium**	**medium /low**	**medium /low**	**medium**		

Table 8-12: Detailed MS main problems encountered

8.8.8.1 National registers capacity summary

Table in this section summarised capacity of existing national systems in terms of number of users and number of operations.

MS	Capacity				
	# of Users	# of records for vehicles	Expected annual increase # of records for vehicles	Yearly number of operations	#of CUD's
AT	15 000	n/a	n/a	n/a	n/a
BE	n/a	n/a	n/a	n/a	n/a
BG	n/a	n/a	n/a	n/a	n/a
CY	n/a	n/a	n/a	n/a	n/a
CZ	n/a	n/a	n/a	n/a	n/a
DE	50 000	120 000 000	5 000 000	160 000 000	150 000
DK	n/a	n/a	n/a	n/a	n/a
EE	550	800 000	70 000	200 000	n/a
EL	n/a	n/a	n/a	n/a	n/a
ES	500	60 000 000	1-1.2 mil in REG/ 18-20 Mil in PTI	25 000 000	18 000 000
FI	30 000	5 000 000	100 000	n/a	n/a
FR	13 000	300 000 000	20 000 000	n/a	60 000 000
HR	n/a	n/a	n/a	n/a	n/a
HU	n/a	2 000 000	n/a	n/a	n/a
IE	600	5 000 000	n/a	1 045 800	5 213 000
IT	75 000	90 000 000	n/a	300 000/day	40 000 000
LT	600	5 000 000	1 000 000	2 000 000	1 500 000
LU	200	1 677 702	75 000	n/a	1 626 417
LV	17 000	19 946 430	80 000	n/a	1 000 000
MT	n/a	n/a	n/a	n/a	n/a
NL	50 000	10 000 000	800 000	200 000 000	10 000 000
PL	7 000	33 257 693	1 500 000	24 091 842	2 300 000
PT	n/a	n/a	n/a	n/a	n/a
RO	1 800	15 000 000	2 000 000	4 500 000	3 400 000
SE	40 000	10 231 892	200 000	20 000 000	300 000 000
SI	n/a	n/a	n/a	n/a	n/a
SK	n/a	n/a	n/a	n/a	n/a
UK	80 000	11 000 000	n/a	n/a	n/a

Table 8-13: National registers capacity summary

8.8.8.2 National register availability

The following table indicates MS answers regarding the monthly availability of their systems.

MS	Availability
AT	n/a
BE	n/a
BG	n/a
CY	n/a
CZ	n/a
DE	99,99%/year
DK	n/a
EE	99,9%/year
EL	n/a
ES	n/a
FI	n/a
FR	100%
HR	n/a
HU	99,8%
IE	99,98%
IT	99%
LT	96-99,7%
LU	98%
LV	99,97%
MT	n/a
NL	99%
PL	98%
PT	n/a
RO	99%
SE	n/a
SI	n/a
SK	n/a
UK	n/a

Table 8-14: National registers' availability

8.8.8.1 National register performance summary

Below table summarises responses on performance measures of MS systems.

MS	Performance		Max. response time
	Min. # of trans./sec	Max. # of trans./sec	
AT	n/a	n/a	n/a
BE	n/a	n/a	n/a
BG	n/a	n/a	n/a
CY	n/a	n/a	n/a
CZ	n/a	n/a	n/a
DE	10	150	3 sec
DK	n/a	n/a	n/a
EE	n/a	n/a	1800 sec
EL	n/a	n/a	n/a
ES	n/a	n/a	Reg: 1 000 000/day PTI: 20 000/hour
FI	n/a	n/a	n/a
FR	1	600	2 sec
HR	n/a	n/a	n/a
HU	n/a	n/a	n/a
IE	n/a	n/a	n/a
IT	n/a	n/a	1 sec
LT	n/a	n/a	5 sec
LU	n/a	n/a	30 sec
LV	n/a	n/a	0,5 sec
MT	n/a	n/a	n/a
NL	200	500	5 sec
PL	no limit	n/a	n/a
PT	n/a	n/a	n/a
RO	0,8	7,5	8 sec
SE	n/a	70	3 sec
SI	n/a	n/a	n/a
SK	n/a	n/a	n/a
UK	n/a	n/a	n/a

Table 8-15: National registers performance summary

8.8.8.2 National register costs summary

This table summarises responses on costs of MS systems.

MS	Costs		
	operations	maintenance	developments & evolutions
AT	n/a	n/a	n/a
BE	n/a	n/a	n/a
BG	n/a	n/a	n/a
CY	n/a	n/a	n/a
CZ	n/a	n/a	n/a
DE		45 000 000 EUR	n/a
DK	n/a	n/a	n/a
EE	31 000 EUR	92 000 EUR	700 000 EUR
EL	n/a	n/a	n/a
ES	450 000 EUR	50 000 EUR	n/a
FI	n/a	n/a	n/a
FR			3 000 000 EUR
HR	n/a	n/a	n/a
HU	300 000 EUR	n/a	5 000 000 EUR
IE		5 000 000 EUR	n/a
IT	n/a	20 000 000 EUR	22 000 000 EUR
LT	37 000 EUR	2 020 000 EUR	585 000 EUR
LU	250 000 EUR	150 000 EUR	100 000 EUR
LV	n/a	n/a	n/a
MT	n/a	n/a	n/a
NL	n/a	n/a	n/a
PL		6 200 000 EUR	1 200 000 EUR
PT	n/a	n/a	n/a
RO	n/a	n/a	n/a
SE	28 100 000 EUR	1 100 000 EUR	12 200 000 EUR
SI	n/a	n/a	n/a
SK	n/a	n/a	n/a
UK	n/a	n/a	n/a

Table 8-16: National registers costs summary

8.8.8.3 National register current network usage

Below table lists networks to which national registers are connected currently.
Acronyms used in this table mean:

n/a – answers were not provided

NAN – national administration network, name of this network is provided in parenthesis afterwards.

MS	Network used
AT	Internet
BE	n/a
BG	n/a
CY	n/a
CZ	n/a
DE	NAN (DOI) sTesta
DK	n/a
EE	NAN (Xroad) Intranet Internet
EL	n/a
ES	NAN Intranet Internet
FI	Internet sTesta
FR	Internet NAN
HR	n/a
HU	NAN sTesta Intranet
IE	sTesta
IT	Internet sTesta Intranet
LT	NAN Intranet Internet
LU	NAN Intranet Internet sTesta
LV	sTesta
MT	n/a

MS	Network used
NL	NAN Intranet Internet sTesta
PL	Intranet Internet sTesta NAN (MEWA) NAN (OST112) NAN (GovNet) NAN (WAN CEPiK)
PT	n/a
RO	Intranet Internet
SE	NAN (SGSI) Intranet Internet sTesta
SI	n/a
SK	n/a
UK	NAN (GSI)

Table 8-17: National registers network usage

8.8.8.4 VIP authorisation summary

Below table presents MS preferences for VIP authorisation being maintained nationally.

MS	VIP National Authorisation
AT	Y
BE	Y
BG	n/a
CY	n/a
CZ	n/a
DE	Y
DK	n/a
EE	Y
EL	n/a
ES	Y
FI	N
FR	Y
HR	Y
HU	N
IE	Y
IT	Y
LT	Y
LU	N
LV	Y
MT	n/a
NL	Y
PL	Y
PT	n/a
RO	Y
SE	Y
SI	n/a
SK	n/a
UK	N

Table 8-18: VIP authorisation summary

8.8.9 Preferred communication channels summary

This table presents MS preferences regarding communication channels and data formats to be used by VIP.

MS	Preferred channel of communication and security to be implemented with VIP								Preferred data format (including security measures) to be exchanged with VIP	
	HTTP/HTTPS		Web-services		FTP/FTPS		e-mail			
	Encrypted	Signature	Encrypted	Signature	Encrypted	Signature	Encrypted	Signature	Encrypted	Signature
AT	Y	n/a	n/a	n/a	n/a	n/a	n/a	n/a	XML	n/a
BE	Y	n/a	Y	n/a	Y	n/a	Y	n/a	n/a	n/a
BG	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CY	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CZ	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DE	Y	n/a	Y	n/a	n/a	n/a	n/a	n/a	XML	n/a
DK	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
EE	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
EL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ES	n/a	n/a	n/a	Y	n/a	n/a	n/a	n/a	n/a	XML
FI	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
HR	n/a	n/a	Y	Y	n/a	n/a	n/a	n/a	XML	XML
HU	Y	Y	Y	n/a	n/a	n/a	n/a	n/a	XML	XML
IE	Y	Y	Y	Y	n/a	n/a	n/a	n/a	XML	XML
IT	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LT	Y	n/a	n/a	n/a	n/a	n/a	n/a	n/a	XML	XML
LU	n/a	n/a	Y	Y	n/a	n/a	n/a	n/a	XML	XML
LV	Y	n/a	Y	n/a	n/a	n/a	n/a	n/a	XML	n/a
MT	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
NL	Y	Y	Y	Y	n/a	n/a	n/a	n/a	XML Binary data Csv	XML Binary data Csv
PL	Y	Y	Y	Y	n/a	n/a	n/a	n/a	XML PDF Csv	XML PDF Csv
PT	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
RO	Y	n/a	Y	n/a	n/a	n/a	n/a	n/a	XML PDF Csv xls	photo

MS	Preferred channel of communication and security to be implemented with VIP								Preferred data format (including security measures) to be exchanged with VIP	
	HTTP/HTTPS		Web-services		FTP/FTPS		e-mail			
	Encrypted	Signature	Encrypted	Signature	Encrypted	Signature	Encrypted	Signature	Encrypted	Signature
									photo	
SE	n/a	n/a	Y	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SI	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SK	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
UK	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table 8-19: Preferred communication channels summary

8.8.10 Member States requirements and suggestions

This table provides an overview of the participating Member States suggestions and requirements emitted through the questionnaires and the interviews. In this table, each suggestion has been given an identifier.

MS Suggestion ID	Requirements and suggestions	% MS
MS01	Re-use EUCARIS	39%
MS02	Establish common data structure and format for data exchanges	32%
MS03	Use open standards	14%
MS04	Single PTI connection point	14%
MS05	Establish clear rules for data usage, including data protection	11%
MS06	Facilitate data exchange with VM	11%
MS07	Store PTI technical data at national level	11%
MS08	Single system for all exchanges	7%
MS09	Gradual development (start with simple system and evolve)	4%
MS10	Have a EU level centralised database	4%
MS11	PTI technical data stored at national level	4%
MS12	Keep database ownership at national level	4%
MS13	MS are responsible for the legitimacy of the request	4%
MS14	Limit the international data exchange to the really needed and relevant data	4%
MS15	Establish multiple connection points per MS	4%

Table 8-20: MS requirements and suggestions

8.9 MS profiles

Austria

PTI - Private garages are authorized, under certain conditions (according to the motor vehicle act and a national regulation), to test vehicles periodically. They are supervised by the local authorities. They issue a test report and a sticker for the vehicle, if the vehicle is in safe condition according to the law. On the sticker, the time for the next inspection is perforated. The test report is handed out to the vehicle holder.

RSI - are conducted by the *Bundesanstalt für Verkehr* (Federal Institute for traffic) and by the authorities and authorized experts with a mobile equipment. Technical Road Side Inspections are conducted by technical experts of the provinces (*Länder*) together with the police. By the Ministry for Transport, Innovation and Technology itself 27 people and 2.6 mio Euro of budgetary funds were used in 2012 for technical roadside inspections. The way and the scope for technical roadside inspections are ruled in a contract between Federal Institute for traffic and the provinces *Burgenland, Steiermark, Kärnten, Tirol and Vorarlberg*. The Federal Institute for traffic is the national contact point for RSI and coordinates control activities and reports to the Austrian parliament and to the European commission.

Existing National Registers:

- **Elektronische Begutachtungsverwaltung - EBV** - (Electronic roadworthiness test management) owned by Österreichischer Wirtschaftsverlag GmbH. The main function of this system is to issue the PTI/RSI test reports and go give information to the inspector as well as to produce the reports to the Commission.
- **Zulassungsevidenz/Kraftfahrzeugregister** (Motor vehicle register) under the responsibility of Ministry of Interior. The system contains all vehicle data and holder data. All Police purposes, controls, national contact point according to Directive 2011/82/EU
- **Zulassungsevidenz** (registrations database) under the responsibility of Versicherungsverband (insurance company association). The system contains all vehicle data and holder data.
- **Genehmigungsdatenbak** (type approval database) under the responsibility of Versicherungsverband (insurance company association). The system contains all vehicle approval data.
- **Central PTI Proof database** – under development, owned by ZBD Verwaltung GmbH. System purpose is information exchange on PTI.

Needs at national level:

- A single connection point is not acceptable, due to lack of national infrastructure and resources that would allow it. The vehicle registration is run by authorized insurance offices (about 1000) all over the country, which use the registration database owned by the insurance company association under supervision of the local authorities, with no central vehicle registration authority.

Specific requirements for a future VIP system:

- **N/A**

Belgium

PTI centres are approved according to the Belgian Royal Decree of 23th December 1994 and they conduct periodical and non-periodical technical inspections. PTI centres are inspected by and organised according to the instructions of the Federal Public Service Mobility and Transport. Information regarding the technical inspections, coming from the PTI centres, is sent to the Crossroads Bank for Vehicles. Holders of the license plates are invited to go to the periodical technical inspection. The Crossroads Bank for Vehicles database and the PTI centres exchange all the necessary flow of technical vehicle information.

RSI - until the reform of the State, the Federal Public Service Mobility and Transport is in charge of conducting the RSI. This is sub-contracted to GOCA which performs the road checks. The sanctioning (e.g. fines) is done by the police officers of the Federal Public Service Mobility and Transport.

Existing National Registers:

- **Crossroads Bank for Vehicles** – database under the responsibility of the Federal Public Service Mobility and Transport. The database contains vehicle registration data, PTI data, vehicle approval data and insurance related data. Its functionality and usage are subject to specific rules and conditions, set out in regulations.

Needs at national level:

- Needs of legal basis that can allow the exchange of technical vehicle information with other MS.
- Preferred connection via Crossroads Bank for Vehicles database which will be the single point of contact.

Specific requirements for a future VIP system:

- Important to have a clear legal basis with and provisions with respect to the data privacy.
- The problem of the lack of technical vehicle data needs to be addressed.

Germany

PTI is handled by the national road act (StVZO), including all responsible organisations and authorities as well as the period and data-collection. The main responsibility is delegated to the regional authorities and registration offices and the Kraftfahrt-Bundesamt (KBA) acts as a national contact point.
Technical Services (TÜV, DEKRA, GTÜ, KÜS…) act as technical execution organisations (technical centres of the different regions or recognised and notified Examination Organisations (Überwachungsorganisationen, ÜOs)). PTI is done either on proving grounds of these organisations or in third party workshops/garages where that collect the results.

RSI of commercial vehicles are performed by the competent Federal as well as the Länder Authorities, according to the national technical control regulation (TechkontrollV). On the federal level the Federal Office for Goods Transport (BAG) is responsible for RSI, while the police authorities are generally the competent institutions of the Länder. RSI can be performed by one authority only or as concerted controls.

Existing National Registers:

- **Central Vehicle Register,** owned by Kraftfahrt-Bundesamt (KBA), retains vehicle and holder data.
- **CoC Database,** owned by KBA, retains VIN based CoC data.
- **Typdatenbank,** owned by KBA, retains technical vehicle data based on type, variant and version
- **argeTP,** owned by KBA, retains type-approval documents coming from own approvals and ETAES
- **ETAES,** owned by KBA, retains type-approval documents from EU-MS-TAA.
- **FSD Database,** owned by "Zentrale Stelle" (Provider: Fahrzeugsystemdaten GmbH (FSD)), retains manufacturer information on technical components and system information; partially VIN based.
- **PTI Result Database,** owned by "Zentrale Stelle", retains German PTI results, VIN based.
- **EUCARIS,** owned by MS, is the EU system for the exchange of vehicle and driving licence data (and also other data, like CoC data).

Needs at national level:

- The preferred way to exchange data is via a single national point of contact. Most suitable seem to be the central Registration Authorities which are responsible for the registration of technical vehicle data and PTI results. National registration authorities already exchange data as national contact points using EUCARIS.
- Storage of PTI results in the national central vehicle register.

Germany

Specific requirements for a future VIP system:

- The already existing decentralized network between the central registration authorities using EUCARIS should be used and expanded. The introduction of an additional/new system regarding vehicle information exchange is neither a successful approach nor necessary.
- For data exchange between the type approval authorities the already existing network ETAES should be used and expanded.
- It would be helpful if manufacturers were obliged to deliver CoC's in an electronic way.
- The dataset of type approval regulations should be extended with the goal that all necessary data for RSI and PTI inspections is included.

Estonia

PTI execution is outsourced to private companies but pre-registration inspection of vehicles is made by the 17 local offices of Estonian Road Administration.
PTI testing centres run reports directly in the online system of ERA, allowing ERA monitoring.
There is no PTI performed on other MS's cars.

RSI:

- **For Estonian nationals, RSI's** are organised by the Ministry of Interior and performed by the Police and Border Guard Board after trained by ERA. For data entry, police officers use their own system and transfer it into the ERA database once a day. If a problem is found by the police, the PTI certificate is cancelled immediately.
- **For vehicles of other EU MS**, if any problem is found, RSI's are organised using the information added in their system. Police informs the Ministry of Economy who then sends the notification to the concerned MS.

Existing National Registers:

- **Traffic Register,** under the responsibility of **Estonian Road Administration,** includes type approval information and all vehicle relevant information.
- **Estonian Road Administration** (ERA) is a government agency under the Ministry of Economic Affairs and Communications responsible for:
    - Preregistration inspection of vehicles
    - Registration
    - Organisation and coordination of PTI
    - Approval of rebuilding
    - Vehicles and their component type approval
    - Educating inspectors of PTI and certify them
- **Connections with other databases:**
    - Population register
    - Insurance register
    - Police database (stolen cars in Estonia)
    - Companies register
    - Ministry system that collects the police reports (this system is also connected to ERRU)

Needs at national level:

- Preferred connection to a future VIP system via the traffic register as IT system under Estonian Road Administration authority.

Specific requirements for a future VIP system:

- A EUCARIS like setup could be useful for the automated XML data exchange. Encourage public and transparent data and use of online mechanisms for efficient exchange which could decrease fraud and allow vehicle holders to check their car history. Estonian citizens can check accident history, PTI history and Odometer history online.

Finland

PTI responsible national authority is Trafi (grants the licences to PTI centres and supervises the PTI centres). Garage, manufacturers and their representatives and vehicle importers are entitled, under defined conditions, to carry out parts of the PTI. All PTI related data is kept in Vehicle Information System ("ATJ"). With the exception of RSI, all stakeholders access the system either directly through a web-interface or indirectly through application-application interfaces. Most PTI stations are using their own interfaces when performing PTI's.

RSI responsible national authorities are Police, Customs and Frontier Guard. Trafi and PTI centres provide technical expertise for vehicles to the RSI responsible national authorities. The results of the RSI's are added into the ATJ system manually by Trafi after receiving the papers from Police. In the near future this will change, so that Police can directly fill the forms in ATJ.

Existing National Registers:

- **Vehicle Information System** ("ATJ") contains all data related to PTI (RSI, registrations and type approvals as well). The system is owned and maintained by Trafi.

Needs at national level:

- Preferred connection to a future VIP system via the Vehicle Information System ("ATJ").

Specific requirements for a future VIP system:

- Preference for a system that acts as a hub for all systems in all Member States, and does not replace the existing national systems.

France

PTI is performed by private centres under the state responsibility. All inspectors are private inspectors as well. The results of the PTI's are stored in the Technical Central Organism (OTC) database, owned by the French ministry of Transport. The OTC system receives all details on the test and the results of the PTI performed (e.g. hour, time, deficiencies, measures, etc…).

RSI – N/A

Existing National Registers:

- **OTC type-approval** database owned by the French Ministry of Transport. Used for the vehicle registration.
- **OTC PTI** database owned by the French Ministry of Transport. Collects and analyses all PTI data.
- **SIV database** owned by the French Ministry of Interior. Used for the vehicle registration.
- **RNC2 database** owned by the French Ministry of Transport. Follows agreement of inspectors and installations.
- **OTC statistic database** owned by the OTC. Provides statistic information to stakeholders.

Needs at national level:

- Single connection is not acceptable. French register system is composed of 5 different database that should be connected to a future VIP system.

Specific requirements for a future VIP system:

- Keep French national database flow.

Hungary

PTI - The National Transport Authority is responsible for PTI. Other certified organizations are also involved in the PTI process. The data concerning PTI are recorded with the help of the central information database of Hungary (KÖKIR). All PTI stations have access to the KÖKIR and use it as a tool for performing PTI and a database with results of PTI performed. Some of PTI data collected in KÖKIR is transferred to the national vehicles register.

RSI - The National Transport Authority, the National Tax and Customs Administration of Hungary, and police officers take part in the RSI. The RSI are organised jointly or independently by the responsible authorities. The results of the RSI organised independently by one authority are not exchanged between all national authorities.

Existing National Registers:

- **KÖKIR**, owned by The National Transport Authority, is used for technical information of the vehicle, PTI's information.
- **Vehicle Register,** owned by COAEPS, contains technical information, PTI, odometer data, owner-holder data, document data, licence plate data, also changes, additional data regarding loan, arrest, blue light etc…

Needs at national level:

- Decide on the connection to a future VIP system:
    - **National Transport Authority's opinion:** Technically it is possible to use the KÖKIR system as a national connection point as it contains all data needed for VIP. National Transport Authority has international data exchange connection points for international systems (ERRU, Tachonet). These systems have the same legal basis as KÖKIR.
    - **COAEPS's opinion:** The single connection point is not an acceptable option at the moment for data exchange. All the technical data of the PTI are kept in the database of the National Transport Authority, but it is not officially accepted register. The officially accepted register (VR) does not contain all the data of the PTI.

Specific requirements for a future VIP system:

- It should contain the technical data of the vehicle, and previous PTI's data (history).

Ireland

PTI is provided at 47 test centres nationwide through a centralised delivery model involving one private sector provider, Applus+. Applus+ owns a centralized database that retains all information regarding the results of the tests. The Road Safety Authority (RSA) has online real time access to this information. Details of the vehicles due for testing are provided to Applus+ by the National Vehicle and Driver File (NVDF - the register of all vehicles registered in the State).
The testing of commercial vehicles is provided through a decentralized delivery model by 150 independent service providers at 150 test centres located throughout the country. The RSA has recently introduced a new computer system, CoVIS, which gives online real time access to all testing activity in these test centres.

RSI is carried out by 14 vehicle inspectors bi-laterally with the national police force and on a multi-agency basis with customs, revenue and other state agencies. Information is shared between all agencies to maximise resources.

Existing National Registers:

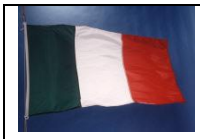
- **Applus Car Testing Service (ACTS),** owned by ACTS (RSA owns all data), retains the results of M1 category vehicles roadworthiness tests.
- **National Vehicle and Driver File (NVDF),** owned by Department of Transport, contains details of all vehicles registered in the State and the expiry dates of their roadworthiness certificates.
- **CoVIS**, owned by RSA, retains results of all roadworthiness tests apart from M1 category vehicles, test reports and detail of all RSI's conducted.

Needs at national level:

- Preferred connection to the NVDF, the only national register relating to all vehicles
- There is currently no information transfer with other MS so any requirements in this regard would be new and new developments at national level need to be planned.

Specific requirements for a future VIP system:

- Suggest having the guidelines similar to the current EUCARIS system on sTESTA.



Italy

PTI responsible authority is the Department of Land Transport (under the responsibility of Ministry of Transport) that performs type approvals, registration of vehicles, PTI and RSI in Italy. PTI on vehicles less than 3500kg of total permissible leaden mass are also performed by private centres (since 1997) under Ministry of transport supervision. Public Motorization structures are the only structures authorised to perform annual PTI on vehicles >3500kg, buses, cabs, ambulances and extraordinary inspections due, for example, to road incidents. After vehicle inspection, the outcome is registered in National Vehicle Archive.

RSI is performed by the Department of Land Transport. Mobile inspection units are used and placed in different locations like customs, ports, etc. Police can also direct vehicles to execute checks to the nearest PTI station.

Existing National Registers:

- **National Register,** owned by Ministry of Transports- Department of Land Transport, registers data on vehicles (any approval, PTI, registrations) and drivers. The National Register contains all data related to the vehicle life as long as it is in Italy (approval, registration, technical modifications, and change of owner, destruction or exportation).

Needs at national level:

- **n/a**

Specific requirements for a future VIP system:

- Preferred connection to the National Register
- In case of re-registration or PTI/RSI in other MS prove is needed that car modifications were approved. Examples of modifications: alternative sizes of wheels, changed fuel (like LPG).
- A unique system with a single communication interface used for all communications related to vehicles is preferred. Therefore EUCARIS is the preferred option for the international data exchange.

Lithuania

PTI is performed by 10 private companies around the country, counting 67 PTI stations. The 10 private companies are members of Lithuanian Association of Companies for Vehicle Technical Inspection TRANSEKSTA. The Association owns and manages CTADB. All 10 companies and association are merged into a single online data network MPLS. CTADB is managed by Oracle Database. CTADB is combined with related institutions registries, information systems and databases.

RSI is performed by the Police and State Road Transport Inspectorate. Mobile and stationary brake testers are used, exhaust gas analysers, lights testing equipment. When serious technical defect are detected, vehicle is directed to technical inspection company for exhaustive technical inspection. Annual results of RSI are published on website of State Road Transport Inspectorate.

Existing National Registers:

- **Centralized technical inspection** data base, owned by Transeksta, the Lithuanian periodical technical inspection association, keeps and exchanges data about vehicles periodical technical inspection.
- **Type approval data base,** owned by the State Road Transport Inspectorate, contains the type approval data.
- **National road transport register** (Register of Road Transport Vehicles of the Republic of Lithuania), owned by the REGITRA, contains the registration data and (since 01/07/2014) monitors, that the vehicles comply with the requirements applicable to road transport vehicles used on the roads (insured, the valid technical inspection, paid fees).
- **KELTRA** (control module), owned by the State road inspectorate, contains the RSI data.

Needs at national level:

- The current systems will have to be adapted to the platform of common VIP. The VIP has to take into account the national rules of data protection. Also the related costs are very important.

Specific requirements for a future VIP system:

- It has to be clearly and specifically stated to whom links to VIP are available, and if authorised. Strict and clear rules on data usage and connection have to be in place. The VIP system cannot be widely open.
- Preferred single point of contact is the Ministry of Transport, as it is the authority responsible for technical information.

Luxembourg

PTI falls under the responsibility of the Government, through the Department of Transport of the Ministry of Sustainable Development and Infrastructures (MDDI). Notifications and reminders to pass vehicles to PTI are sent to the vehicle owners or holders by SNCA (Société Nationale de Circulation Automobile), on behalf of the Ministry. Conformity checks on new and imported vehicles are performed by SNCA. The PTI's are organised and performed by inspection bodies to be nominated by the Ministry: currently, there is only one inspection body nominated in Luxembourg, namely SNCT (Société Nationale de Contrôle Technique)**.**

RSI's legislation and regulation processes are in the hands of the Government, through the Department of Transport of MDDI. The planning and organisation of RSI's is arranged by the Administration of Customs (the Customs), in coordination with SNCT. The RSI's include a technical inspection of the vehicle (performed by the SNCT inspectors, on a mobile inspection station) as well as checks of the carriage documents, the carriage safety, the tachograph card, etc…All data are stored in an xls file. After each control, data from RSI report are sent to the Ministry (data storage not done electronically). Statistics are sent to the EU institutions on a bi-yearly basis.

Existing National Registers:

- **LUVIS** (Luxembourg Vehicle Information System) owned by MDDI and managed by SNCA. It is the central national register for all data related to all road vehicles registered in LU.
- **SNCT_DB** owned by SNCT will register of vehicles inspected by SNCT. The database is under development.

Needs at national level:

- Preferred connection to VIP through one single national contact point (SNCP). The SNCP would, in case of, be the system LUVIS.
- Preferred access to the VIP through an authorisation process handled at EU level (EU directive or EU Regulation).

Specific requirements for a future VIP system:

- All national PTI available through one single point.
- Use the EUCARIS network for the trans-border exchange of PTI/RSI information.
- Limit the international data exchange to the really needed and relevant data - the (last) inspection date, the global inspection result, the limit validity date for the last issued inspection certificate, the odometer reading during the (last) inspection, and adding, in case of a rejected vehicle, the (coded) reason(s) of this rejection.

Latvia

PTI responsibility is delegated by Law on Road Traffic to CSDD along with the registration of vehicles, issuing registration certificates and number plates, issuing driver's licences and examination of persons for that purpose. CSDD has PTI stations of its own, and supervises private companies involved in PTI. CSDD also carries out attestation of all PTI inspectors. PTI (and RSI) requirements are laid down in national Regulation on State Technical Inspection and Road-Side Inspection of Vehicles. All PTI data are entered into the national Register of Vehicles and Drivers in real time. PTI report is print-out of the data stored in the National Register.

RSI is performed by CSDD, the sole body entrusted with RSI according to Law on Road Traffic. One team of inspectors covers all territory. All RSI data are entered into the National Register in real time. RSI report actually is print-out of the data stored in the National Register**.**

Existing National Registers:

- **National Register** is owned by CSDD and contains all data related to any approval, registration, technical modifications, PTI and RSI of vehicles registered in Latvia (in case of RSI – also RSI data of vehicles registered abroad); data of drivers, pawned vehicles and vehicles wanted by law enforcement bodies.

Needs at national level:

- Preferred connection to VIP through one single national contact point.

Specific requirements for a future VIP system:

- VIP must be compatible with all existing national registers/systems; it must work in real time.
- VIP must include more than CoC data which is clearly not enough for the purpose of PTI/RSI.

The Netherlands

PTI inspections in The Netherlands are performed by RDW certified companies. The frequency of inspection depends on the type of vehicle. The results of the PTI inspections are stored electronically**.** RDW is a non-departmental public body (NDPB) under the Ministry of Infrastructure and Environment.
RDW uses on-line exchange for data consultation and reporting.
It is possible to perform PTI in Belgium on Dutch vehicles thanks to bi-lateral agreements. Re-inspection can also be performed in Belgium with Belgian quality rules.
Dutch PTI is also possible in Spain for personal vehicles but re-inspection is performed by Spanish authorities.

RSI inspections are performed by RDW on request of the inspection body of Ministry of Police. In particular for heavy vehicles, with more than 3.5 T, an inspection is mandatory. After inspection, a small report is sent to European Commission. The report is sent on paper form.

Existing National Registers:

- **BRV: National Vehicle Register the Netherlands** is owned by RDW R&I (Registration & Information). It contains data on vehicle registration and owner/holder of vehicles data.
- **EKI: PTI (results) database**
- **European Type Approval Register**
- **CoC Database**

Needs at national level:

- Information storage of electronic safety systems installed on the cars for PTI

Specific requirements for a future VIP system:

- Strongly recommend to use the existing international exchange mechanism EUCARIS
- All vehicle information needed for legal tasks has to be delivered to and has to be stored in our national (centralised vehicle register)
- Electronic CoC's are necessary for efficient storage of relevant technical vehicle data at first registration; technical vehicle data have to be exchanged to support inspections abroad (RSI and PTI in the near future)

Poland

PTI - periodic roadworthiness tests for vehicles carried out by private bodies. District Governors are responsible for supervision of testing centres (around 3500). Due to decentralisation the exact number of inspection stations that are currently performing PTI is unknown.
According to data from the central register of vehicles there are approximately 10 000 000 PTI with a positive result per year. Total number of PTI performed – including these with negative result (that for the time being are not collected in the central register of vehicles) cannot be provided.

RSI - decentralized responsibility within the competences of different authorities:

- The Police
- Inspectors of The Inspection of Road Transport
- Border Guards
- Customs officers

As it is decentralized responsibility within the competences of different authorities, the total number of vehicles that undergo roadside inspections every year cannot be provided.

Existing National Registers:

- **CEPiK** (under the responsibility of Minister of Interior) is the central register of vehicles and the central register of drivers supported by the common IT system. System CEPiK supports the processes of collecting and processing vehicle data in the central register of vehicles as well as the process of giving access to these data to authorized bodies. The prime objective of the system is to improve the road safety.
- **PTI Registers** (under the responsibility of the PTI centres).
- ***SI Pojazd*** *(Polska Wytwórnia Papierów Wartościowych (PWPW S.A.)) – not relevant for the study*

Needs at national level:

- Dedicated IT solution for testing centres to exchange data with VIP would have to be provided.
- The IT solution should respect the differences between MS as far as the PTI processes and procedures are concerned. As far as IT solutions for PTI in Poland are concerned– PTI centres have different applications/software deployed to manage their PTI registers. Their systems are neither integrated nor even homogeneous

Specific requirements for a future VIP system:

- Preferred connection to VIP through CEPiK (for PTI data, unknown at this stage for RSI data)
- Models dictionary would be helpful

Romania

PTI responsible national authority - Registrul Auto Roman (Romanian Automotive Register) - RAR, specialized technical body of the Ministry of Transport in the field of vehicles approval (framework directives) and vehicles PTI. The PTIs are performed by the RAR through its county representatives and through private PTI centres authorized and supervised by RAR.

RSI responsible national authority – Inspectoratul de Stat pentru Controlul in Transportul Rutier (State Inspectorate for Control in Road Transport) – ISCTR, technical body of the Ministry of Transport specialized and designated to assure the inspection and enforcement of the national and international rules and regulation in the road transport field, and also the roadside inspection of the commercial vehicles.

Existing National Registers:

- **PTI database,** owned by RAR, contains data of vehicle which performed PTI (PTI centre, identification of the inspector, vehicle identification number, vehicle registration plate, identified defects, defect category, PTI validity, etc.).
- **Control software application**, owned by ISCTR, contains all data resulted from the controls carried out, including the sanctions applied and the RSI reports. The system cannot perform direct exchange of information. Exchange of information is carried out by other methods. For monitoring of the PTI activities carried out by the PTI centres and by the technical inspectors, ISCTR send to RAR the information regarding the commercial vehicles which have been found at RSI as having major and/or dangerous defects.

Needs at national level:

- Preferred connection to VIP through one single point of contact – PTI database.

Specific requirements for a future VIP system:

- One single connection point would not be convenient.
- Extension of EUCARIS functionality to cover VIP seems the most convenient for the exchange of PTI and RSI information. It is already present in the re-registration of vehicles act. Seems to be the most appropriate platform to be reused.

Spain

PTI competence depends on the Autonomous Communities (Regional administration). This organism decides whether applies this competence on its own or delegates it to another organisation. Industry Ministry along with the Autonomous Communities establishes the main guidelines defining PTI, taking into consideration European regulations. Spanish legislation standardises as compulsory to inform about the outcome of PTI to the Vehicle Register (DGT/Interior Ministry). The Vehicle Register saves a back-up of PTI relative to almost all registered vehicles: results, dates, failures, etc... .

RSI is partly implemented by Traffic Police Department supported by the technical collaboration of the Autonomous Communities, that report the result of the inspection

Existing National Registers:

- **Type Approval Register**, owned by Industry Ministry, contains valid type approval numbers.
- **Stolen vehicle register**, owned by Industry Ministry, contains information about number plate and VIN of vehicles considered as stolen in Spain or UE.
- **Vehicle Register**, owned by Industry Ministry, contains information concerning ownership, administrative and technical data of the vehicles registered in Spain.

Needs at national level:

- Preferred connection to VIP through Vehicle Register which is the most important National system.

Specific requirements for a future VIP system:

- Need of a legislation concerning the exchange of data between the MS.
- Currently, there is a platform called EUCARIS that allows information exchange between MS. Legislations and directives lastly approved by UE established as compulsory the use of EUCARIS. Although this system is very successful, in order to avoid an overestimated waste of personal and economical resources we suggest that MS keep using EUCARIS or a very similar platform

Sweden

PTI companies are private companies reporting to the Swedish Transport Agency by entering the results straight into the database. PTI is performed on new cars for the first time after 3 or 4 years, subsequently 2 years after that and then every year after that. The vehicle information and specificities of the vehicle are registered by the manufactures' representative through file transfer into the database. This information is verified partially by the type approval. For privately imported cars, the Swedish Transport Agency performs the background check on the vehicle, and approves registration; the PTI company confirms the identity of the vehicle, performs the technical inspection, conformity of such, and enters all necessary technical information into the database.

RSI is performed by a policeman or a vehicle inspection serviceman designated by The Swedish National Police Board. It is performed to prevent unfit vehicles from travelling on the road, check on cargo, tachographs, or taximeters. The data is entered by the roadside inspector or called in to the police office straight into our database at the Swedish Transport Agency, both for Swedish and foreign vehicles.

Existing National Registers:

- **The Vehicle and Driver license register**, owned by Swedish Transport Agency, contains all vehicle information including technical, owner, holder, insurance, PTI, wanted(stolen or other), commercial traffic information and information on vehicle tax and fees.

Needs at national level:

- Preferred connection through the Swedish Transport Agency (single point of contact).

Specific requirements for a future VIP system:

- Need of guidelines for the use of the VIP

United Kingdom

PTI of cars and motorcycles are tested in the private sector under the "MOT Scheme". The Driver and Vehicle Standards Agency (DVSA) along with Department for Transport manage and enforce compliance with applicable legislation. Authority to test is granted to Authorised Examiners (the legal entity and its principals accountable for compliance), Vehicle Testing Stations (one or more garages/locations where Authorised Examiners can conduct tests and Nominated Testers – individuals who are approved to test and designated Vehicle Test Stations. The Driver and Vehicle Licensing Agency (DVLA) is the Registration Authority. The Vehicle Certification Agency (VCA) is the national vehicle type approval authority (individual vehicle approval is provided by DVSA). DVLA and VCA are also executive agencies within Department for Transport's Motoring Services Group. PTI of Heavy Goods Vehicles (HGV's) and Public Service Vehicles (PSV's) is undertaken by DVSA civil servants.

RSI is conducted by DVSA licences HGV and PSV Operators under delegated authority of the Traffic Commissioners as part of its statutory regulatory powers. Inspections are targeted based on the Operator Compliance Risk Score (OCRS). The risk score is informed by a number of data sources which includes outcomes of PTI (GB Operators), previous RSI records, intelligence and information provided by other enforcement agencies.

Existing National Registers:

- **MOT**, owned by DVSA (driver vehicle services Agency), retains data on light vehicles and motorcycles. System itself and intellectual property is Atos.
- **Vehicle Testing System (VT)**, owned by DVSA, retains data on PTI on lorries and public transport 2/M3 and O3/O4.
- **Mobile Compliance retains**, owned by DVSA, stores RSI information of vehicles operated commercially that come under operator licensing.
- **National vehicle register** (has access to a local copy of MOT), owned by Driver and vehicle license authority, stores mainly CoC information (vehicle weights, type approval.
- Northern Ireland and Gibraltar have separate PTI systems – Future PTI integration of the Northern Ireland registration system foreseen.

Needs at national level:

- Not certain whether there is a need for a VIP in the UK:
    - Not much cross-border traffic (island)
    - UK wants to move towards more and more open data access online

Specific requirements for a future VIP system:

- The business benefits of the VIP and a single connection point would need to be justified by DfT and its executive agencies.

8.10 Requirements detailed

8.10.1 General functional requirements

General functional requirements describe the main functionalities required for the VIP in the scope of international vehicle data exchange. From the new RW package, we can derive the following requirements:

They are derived from the new RW package. For each general functional requirement, the following table provides a requirement identifier, short and complete descriptions and the source of the requirement.

ID	Short description	Full description	Source
FR01	Exchange additional technical data for the purpose of PTI.	"*In accordance with the principles laid down by Regulation (EC) No 715/2007*[77] *of the European Parliament and of the Council1 and by Regulation (EC) No 595/2009*[78] *of the European Parliament and of the Council, the Commission shall, by means of implementing acts, and before 20 May 2018, adopt:* *(a) a set of technical information on braking equipment, steering, visibility, lamps, reflectors, electrical equipment, axles, wheels, tyres, suspension, chassis, chassis attachments, other equipment and nuisance necessary for roadworthiness testing of the items to be tested and on the use of the recommended test methods, in accordance with point 3 of Annex I, and* *(b) the detailed rules concerning the data format and the procedures for accessing the relevant technical information.* *Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 19(2).* *The technical information referred to in point (a) of the first subparagraph shall be made available, free of charge or at a reasonable price, by the manufacturers to testing centres and relevant competent authorities, in a non-discriminatory manner.* *The Commission shall examine the feasibility of establishing a single point of access for that technical information.*"	RW package, PTI, Art. 4^3

[77] Regulation (EC) No 715/2007 of the European Parliament and of the Council of 20 June 2007 on type approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information, OJ L 171/1 of 29.06.2007

ID	Short description	Full description	Source
FR02	Exchange PTI and RSI data	"*The Commission shall examine the feasibility, costs and benefits of establishing an electronic vehicle information platform by taking advantage of existing and already implemented IT solutions with regard to international data exchange so as to minimise costs and avoid duplication. In examining the matter, the Commission shall consider the most appropriate way to link the existing national systems with a view to facilitating exchanges of information on data relating to roadworthiness testing and odometer readings between the competent authorities of Member States responsible for testing, registration and vehicle approval, testing centres, test equipment manufacturers and vehicle manufacturers.*"	RW package PTI[3], Art. 16
FR03	Storage of information related to accidents	"*The Commission shall also examine the feasibility, costs and benefits of collecting and storing available information concerning the main safety-related components of vehicles which have been involved in serious accidents as well as the possibility of making information on accident history and odometer readings available in an anonymised form to inspectors, holders of registration certificates and accident researchers.*" Note: from the legislation, anonymised information on accidents history and odometer reading has to be available to the holders of registration certificates. Because odometer readings are recorded during PTI and RSI, vehicle historical information could be available based on information collected on all events where odometer values are recorded.	RW package PTI[3], Art. 16

[78] Regulation (EC) No 595/2009 of the European Parliament and of the Council of 18 June 2009 on type-approval of motor vehicles and engines with respect to emissions from heavy duty vehicles (Euro VI) and on access to vehicle repair and maintenance information and amending Regulation (EC) No 715/2007 and Directive 2007/46/EC and repealing Directives 80/1269/EEC, 2005/55/EC and 2005/78/E, OJ L 188/1 of 18.07.2009

ID	Short description	Full description	Source
FR04	Link existing systems	"*(…) link the existing national systems with a view to facilitating exchanges of information on data relating to roadworthiness testing and odometer readings between the competent authorities of Member States responsible for testing, registration and vehicle approval, testing centres, test equipment manufacturers and vehicle manufacturers.*"	RW Package PTI[3], Art. 16
FR05	Mutual recognition of PTI	"*Roadworthiness has a direct impact on road safety and should therefore be reviewed periodically. The Commission should report on the effectiveness of the provisions of this Directive, including those relating to its scope, the frequency of testing, further enhancement of the roadworthiness system through electronic information exchange and the potential in the future for mutual recognition of roadworthiness certificates.*"	RW Package PTI[3], Art. 20

ID	Short description	Full description	Source
FR06	Exchange of: - registration data, - CoC, - RW Certificate, - technical data for PTI.	„*In order to reduce administrative burdens and to ease the exchange of information between Member States, information relating to vehicles should be recorded electronically.* *(6) This Directive should not prevent a Member State from regarding the electronic dataset kept by its competent authorities as the main source of information about a vehicle registered in its territory. It should be possible for Member States to use an electronic network, comprising data from national electronic databases, in order to facilitate the exchange of information.* *(…)* *Member States shall record electronically data on all vehicles registered on their territory. Those data shall include:* *(a) all mandatory elements in accordance with point II.5 of Annex I as well as the elements of points II.6(J) and II.6(V.7) and (V.9) of that Annex, where the data are available;* *(b) other non-mandatory data listed in Annex I or data from the certificate of conformity as provided for in Directive 2007/46/EC of the European Parliament and of the Council* , where possible;* *(c) the outcome of mandatory periodic roadworthiness tests in accordance with Directive 2014/.../EU of the European Parliament and of the Council and the period of validity of the roadworthiness certificate.* *(…)* *5. Technical vehicle data shall be made available to the competent authorities or testing centres for the purpose of periodic roadworthiness testing. Member States may limit the use and the dissemination of such data by testing centres in order to avoid their misuse.*"	RW Package Registration documents for vehicles[5], Art. 1 (3)

ID	Short description	Full description	Source
FR07	Electronic exchange of RW Certificates	"(43) *Roadworthiness has a direct impact on road safety and should therefore be reviewed periodically. The Commission should report on the effectiveness of the provisions of this Directive, including those relating to its scope, the frequency of testing, further enhancement of the roadworthiness system through electronic information exchange and the potential in the future for mutual recognition of roadworthiness certificates.*"	RW Package PTI[33], para 43 (preamble)
FR08	Send RW Certificate after PTI with accompanying optional information about vehicle use suspension	"*Member States shall ensure that the results of the roadworthiness test are notified, or made available electronically, as soon as possible to the authority responsible for registration of the vehicle. That notification shall contain the information mentioned in the roadworthiness certificate.*" *"In the case of major deficiencies, the test shall be deemed to have been failed. The Member State or the competent authority shall decide on the period during which the vehicle in question may be used before it is required to undergo another roadworthiness test. The subsequent test shall take place during a period defined by the Member State or competent authority but not later than two months following the initial test.* *In the case of dangerous deficiencies, the test shall be deemed to have been failed. The Member State or the competent authority may decide that the vehicle in question is not to be used on public roads and that the authorisation for its use in road traffic is to be suspended for a limited period of time, without requiring a new process of registration, until such time as the deficiencies are rectified and a new roadworthiness certificate is issued testifying that the vehicle is in a roadworthy condition."*	RW Package PTI[3], , Articles 8, 9

ID	Short description	Full description	Source
FR09	Check RW Certificate during RSI	"*Member States shall require that the roadworthiness certificate corresponding to the most recent periodic roadworthiness test or a copy thereof or, in the case of an electronically produced roadworthiness certificate, a certified or original printout of that certificate, and the report of the most recent technical roadside inspection, be kept on board the vehicle when they are available. Member States may allow their authorities to accept electronic evidence of such inspections when information in that regard is accessible.*" "*In each initial technical roadside inspection of a vehicle, the inspector* *(a) shall check the latest roadworthiness certificate and technical roadside inspection report, where available, kept on board, or electronic evidence thereof in accordance with Article 7(1);*"	RW Package, RSI[4], Art. 7 RW Package, RSI[4], Art. 10
FR10	Check previous RSI report during RSI	"*In each initial technical roadside inspection of a vehicle, the inspector* *(…)* *The inspector shall verify whether any deficiencies indicated in the previous technical roadside inspection report have been rectified.*"	RW Package, RSI[4], Art. 10
FR11	Send RSI test report in case of major or dangerous deficiencies	"*In cases where major or dangerous deficiencies, or deficiencies resulting in a restriction or prohibition on the use the vehicle, are found in a vehicle not registered in the Member State of inspection, the contact point shall notify the results of the inspection to the contact point of the Member State of registration of the vehicle That notification shall contain the elements of the roadside inspection report as set out in Annex IV*"	RW package, RSI[4], Art. 18

ID	Short description	Full description	Source
FR12	Send RSI notification to take appropriate follow-up action in case of major or dangerous deficiencies	"*In cases where major or dangerous deficiencies are found in a vehicle, the contact point of the Member State in which the vehicle has been inspected may request the competent authority of the Member State in which the vehicle is registered, via the contact point of the latter Member State, to take appropriate follow-up action, such as submitting the vehicle to a further roadworthiness test as provided for in Article 14.*"	RW package, RSI[4], Art. 18
FR13	Bi-yearly RSI statistics for Commission	"*Before 31 March 2021 and before 31 March every two years thereafter, Member States shall communicate to the Commission, by electronic means, the data collected relating to the previous two calendar years and concerning the vehicles inspected in their territory. Those data shall indicate:* *(a) the number of vehicles inspected;* *(b) the category of vehicles inspected"* *c) the country of registration of each vehicle inspected;* *(d) in the case of more detailed inspections, the areas checked and the items failed, in accordance with point 10 of Annex IV.* *The first report shall cover the period of two years beginning on 1 January 2019.* *2. The Commission shall adopt detailed rules, in accordance with the examination procedure referred to in Article 23(2), concerning the format in which the data referred to in paragraph 1 are to be communicated by electronic means.*"	RW package, RSI[4], Art. 20

ID	Short description	Full description	Source
FR14	Exchange risk rates	"*For vehicles referred to in points (a), (b) and (c) of Article 2(1), Member States shall ensure that the information concerning the number and severity of deficiencies set out in Annex II and, where applicable, Annex III found on vehicles operated by individual undertakings is introduced into the risk rating system established under Article 9 of Directive 2006/22/EC.* *For the attribution of a risk profile to an undertaking, Member States may use the criteria set out in Annex I. That information shall be used to check undertakings with a high risk rating more closely and more often. The risk rating system shall be operated by the competent authorities of the Member States.* *For the purpose of implementing the first subparagraph, the Member State of registration shall use the information received from other Member States pursuant to Article 18(1).*"	RW package, RSI[4], Art. 6
FR15	Possibility to check RW certificate during re-registration	"3. *Without prejudice to Article 5, in the case of re-registration of a vehicle already registered in another Member State, each Member State shall recognise the roadworthiness certificate issued by that other Member State, as if it had itself issued that certificate, provided that the roadworthiness certificate is still valid in terms of the frequency intervals established for periodic roadworthiness tests by the re-registering Member State. In cases of doubt, the re-registering Member State may verify the validity of the roadworthiness certificate before recognising it.*"	RW package, PTI[3], Art. 8

ID	Short description	Full description	Source
FR16	Possibility to retrieve previous RW Certificate	"*(25) Odometer fraud should be regarded as an offence liable to a penalty, because manipulation of an odometer may lead to an incorrect evaluation of the roadworthiness of a vehicle. The recording of mileage in the roadworthiness certificate and access for inspectors to that information should facilitate the detection of odometer tampering or manipulation. The exchange of information on odometer readings between the competent authorities of Member States should be examined by the Commission.* *(26) A roadworthiness certificate should be issued after each test. This should include, inter alia, information concerning the identity of the vehicle and the results of the test. The test results should be made available electronically. With a view to ensuring a proper follow-up of roadworthiness tests, Member States should collect and retain such information in a database, in particular for the purposes of analysis of the results of the periodic roadworthiness tests.*"	RW package, PTI[3] para 25 (preamble)
FR17	Vehicle end-of-life notification	„*In the event that the competent authority of a Member State receives notification that a vehicle has been treated as an end-of-life vehicle in accordance with Directive 2000/53/EC of the European Parliament and of the Council, the registration of that vehicle shall be cancelled permanently and information to that effect shall be added to the electronic register.*"	RW package, Registration documents for vehicle[5], Art. 1.4
FR18	Single point of access for PTI technical data	*"The Commission shall examine the feasibility of establishing a single point of access for that technical information."*	RW package, PTI[3], Art. 4

Table 8-21: VIP Functional requirements

8.10.2 Data entities

The following table provides an overview of all described data entities, together with an identifier, a possible business key allowing searching for the information contained in that data entity.

ID	Entity name	Description	Business key
FD 01.	Certificate of Conformity (CoC)	CoC data	VIN
FD 02.	CoC technical data	Subset of CoC data needed to perform PTI	VIN
FD 03.	Vehicle end-of-life notification	Notification that vehicle has been treated as end-of-life.	VIN
FD 04.	PTI technical data	Specific vehicle technical data, needed to perform PTI	VIN, Vehicle Type - Variant - Version (TVV)
FD 05.	Equipment technical data	All equipment data needed to set-up and maintain testing tools	equipment type, version
FD 06.	RW certificate	The RW certificate certifies that the vehicle meets the technical inspection requirements.	VIN, License plate/MS
FD 07.	Risk Rate	Calculated risk rate for an undertaking	Undertaking licence number
FD 08.	RSI report	The RSI report provides result of the RSI performed.	VIN, License plate/MS
FD 09.	RSI notification for requesting measures	Notification requesting measures to be taken regarding the offender of a negative RSI (it is always sent together with RSI report)	VIN License plate nr / Country of Registration
FD 10.	RSI national statistics overview	National RW report: single summary table Defined report from MS to EU Institutions, statistics on the results of RSI per vehicle category and per MS of registration	Reporting MS, reporting period, Issuing MS, Vehicle category

ID	Entity name	Description	Business key
FD 11.	RSI national statistics detailed	For each country of registration of checked vehicles a separate detailed table containing information on checked and detected deficiencies for each vehicle class	Reporting MS, reporting period, Issuing MS, Vehicle category, defect
FD 12.	Vehicle history	Vehicle history events	VIN
FD 13.	Accident data	Information concerning the main safety-related components of vehicles which have been involved in serious accidents	To be defined
FD 14.	VIP usage statistics	VIP performance and usage data	To be defined

Table 8-22: List of VIP data entities

8.10.2.1 Certificate of Conformity

A topic group from the EReg association is currently working on the CoC data exchange between vehicle manufacturers and Member State. Part of their work concern the definition of data format and data structure of the certificate of conformity. It is suggested to refer to this work for the definition of this data entity.

8.10.2.2 Certificate of Conformity technical data

See above.

8.10.2.3 Vehicle end-of-life notification

ID	Data name
1	VIN number
2	License plate
3	Registration MS
4	Date end-of-life
5	MS issuing the Notification

8.10.2.4 Periodical technical inspection technical data

Vehicle periodical technical inspection (PTI) technical data delivered by vehicle manufacturers is a set of technical information on braking equipment, steering, visibility, lamps, reflectors, electrical equipment, axles, wheels, tyres, suspension, chassis, chassis attachments, other equipment and nuisance necessary for the execution of PTI.
It also includes all information needed by PTI centres to verify the functionality of electronically controlled units (ECU).

At the time of writing, the following ECU's have been identified:

- Electronic Stability Control (ESC);
- Anti-lock Braking System (ABS);
- Electronic Braking System (EBS);
- Electronic Power Steering (EPS);
- Emergency Brake Assist (EBA);
- Supplemental Restraint Systems (SRS);
- Safety Belt Load Limiter;
- Safety Belt Pretensioner;
- Airbag.

Information needed by PTI centres to verify the functionality of ECUs can be split into 2 parts:

1) Generic system information:
   a) System description;
   b) System design/functionality/operation/test method;
   c) Vehicle status requirements to allow a PTI test to be conducted;
   d) Related ECSS which share sensors, components or functions.
2) Specific technical information needed for all of safety electronic components:
   a) Identity of the ECSS fitted by VIN;
   b) ECSS version;
   c) ECSS software version;
   d) Communication protocol used;
   e) Communication details (16 pin configuration/pins used, communication protocol used, timing requirements, handshake requirements, data format etc.);
   f) ECU ID;
   g) Diagnostic Trouble Codes (DTC) ID;
   h) ECSS data format;
   i) Sensor ID;
   j) Sensor values;
   k) Component/actuator activation data;
   l) Activation sequence;
   m) Diagnostic Trouble Codes (DTC) thresholds;
   n) ECSS test sequence when related ECSS are automatically tested.

As PTI technical data continuously evolve, this information has to remain the ownership of the vehicle manufactures.
The list of data, data format and data structure is not fixed by any regulation yet.
At the time of writing, a feasibility study is conducted in parallel to this study in order to identify test procedures and set-up test tools with the objective of testing ECU's functionalities.

8.10.2.5 Equipment technical data

N/A.

8.10.2.6 Roadworthiness certificate

ID	Data name
1	VIN number
2	registration plate number and country symbol of state of registration
3	place and date of the test
4	odometer reading at time of the test if available
5	vehicle category if available
6	Identified deficiencies and their category
7	Result of the RW test
7a	date of next periodical test or expiry of the current certificate (if this information is not provided by other means)
7b	name of inspection organisation and signature or identification of the inspector responsible for the test
7c	Other information

8.10.2.7 Risk rate

ID	Data name
1	Number of Community Licence
2	Date rate is calculated
3	Risk rate

8.10.2.8 RSI report

ID	Data name
1	Place of check
2	Date
3	Time
4	Vehicle nationality mark and registration number
5	Vehicle identification/VIN number
6	Category of Vehicle
7	Odometer reading at the time of inspection
8	Undertaking carrying out transport
a	Name and address
b	Number of Community Licence (regul (EC 1072/2009))
9	Driver name
10	Checklist (for each item, specify if checked, not checked, failed)
(0)	(0) Identification

ID	Data name
(1)	(1) braking equipment
(2)	(2) steering
(3)	(3) visibility
(4)	(4) lighting equipment and electric system
(5)	(5) axles, wheels, tyres, suspension
(6)	(6) chassis and chassis attachments
(7)	(7) other equipment including tachograph and speed limitation device
(8)	(8) nuisance including emissions and spillage of fuel and/or oil
11	Result of inspection
	Ban on using the vehicle, which has serious defects Y/N
12	Miscellaneous / Remarks
13	Authority/ Officer or inspector having carried out the inspection

8.10.2.9 RSI notification

ID	Data name
1	Notification nr
2	RSI test report reference
3	List of tests to be performed during additional technical inspection

8.10.2.10 RSI national statistics overview (RSI)

This report provides summary table of all RSI performed by a Member State during a period of 2 years.

Data name		
Reporting MS		
Reporting Period		
	From (YYYY)	
	To (YYYY)	
Per country of registration		
	Vehicle category N2	
		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category N3	
		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category M2	
		Number of Vehicles checked

		Number of prohibitions issued
	Vehicle category M3	
		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category O3	
		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category O4	
		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category Other	
		Number of Vehicles checked
		Number of prohibitions issued
	Total	
		Number of Vehicles checked
		Number of prohibitions issued

8.10.2.11 RSI national statistics detail

This report provides the results of more detailed RSI inspections performed by a Member State during the reported period of 2 years

For each Country of registration, these statistics report the number of failures detected per registration Member State, per vehicle category and per defect.

Data name		
Reporting MS		
Reporting Period		
	From (YYYY)	
	To (YYYY)	
Country of registration		
For the specific country of registration:		
	Vehicle category N2	
		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category N3	
		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category M2	
		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category M3	
		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category O3	
		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category O4	

		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category Other	
		Number of Vehicles checked
		Number of prohibitions issued
	Total	
		Number of Vehicles checked
		Number of prohibitions issued
Per defect detail:		
Defect detail identification number:		
	Vehicle category N2	
		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category N3	
		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category M2	
		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category M3	
		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category O3	
		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category O4	
		Number of Vehicles checked
		Number of prohibitions issued
	Vehicle category Other	
		Number of Vehicles checked
		Number of prohibitions issued
	Total	
		Number of Vehicles checked
		Number of prohibitions issued
	Total # of failures	

The reference list of defect details is the following:

- (0) Identification
- (1) braking equipment
- (2) steering
- (3) visibility
- (4) lighting equipment and electric system
- (5) axles, wheels, tyres, suspension
- (6) chassis and chassis attachments
- (7) other equipment including tachograph and speed limitation device
- (8) nuisance including emissions and spillage of fuel and/or oil

- (10) cargo securing
- Additional defect details: identification nr of the detail is provided

8.10.2.12 Vehicle history

id	Data name		Comment
1	VIN		
2	List of events		
		Date event	
		Type event	Registration, PTI, RSI, accident, vehicle modification
		Odometer value	

8.10.2.13 Accident data

id	Data name
1	VIN
2	Date accident
3	Odometer value
4	List of Safety components present

8.10.2.14 VIP usage statistics

The VIP usage statistics are to be defined at the time of implementation. Some examples are are:

- For a period of time (ie weekly basis)
  - Per message type:
  - Number of messages sent and received per message type
  - Number of positive responses
  - Number of negative responses
  - Number of messages not responded
- VIP system performance measures
  - Response times
  - CPU usage
  - Memory usage

8.10.3 Stakeholders description

8.10.3.1 Registration authority

1. Description

The registration authority is public service acting at national level.
The national Registration authority is responsible for issuing vehicle registration certificates to registration holders. Issuing vehicle registration certificate requires the reception of the CoC from the Vehicle Manufacturers.
Taking into account the new identified need for vehicle historical data collection and transmission, registration authorities would be responsible for the international data exchange of this data.

Registration authorities play a key-role in the vehicle life-cycle process as they provide the authorisation for a vehicle to drive on the road. When a vehicle has been treated as end-of-life registration authorities are notified and record this information.

2. Roles and responsibilities

- Responsible for issuing registration certificate of any vehicle after having performed the necessary checks and validations.
- Handling vehicle registration data throughout the vehicle life-cycle (change of ownership, vehicle end-of-life …).
- Provide registration holder access to the information stored.
- Own all data related to vehicle registration.
- Store whole/part of CoC data as part of the registration process.
- Provide PTI authorities and testing centres with the CoC technical data.
- Store vehicle history as part of the re-registration process.
- Provide other MS' registration authorities with relevant information in the scope of re-registration.
- Record the vehicle end-of-life information.
- National contact point for registration data exchange.

3. Communication

The following table identifies with which stakeholders' registration authority communicates with, the purpose and what kind of data is exchanged.

With who	Purpose	What	Comment
Other MS Registration authorities	Re-register vehicle from another MS Enforce PTI result (suspension of registration / lifting of suspension)	RW certificate, CoC, vehicle history, vehicle end-of-life.	International
PTI authorities	Provide CoC technical data Check, verify RW certificate	CoC technical data RW certificate	National/ International
PTI centres	Perform PTI	CoC technical data	National / International

Table 8-23: Registration authority communication channels

8.10.3.2 PTI authority

1. Description

The PTI authority is public service acting at national level. This authority is responsible for the enforcement of EU and national regulations concerning PTI for all concerned vehicles. It supervises PTI centres and PTI inspectors, providing the legal authorisation to PTI testing centres and inspectors to perform PTI.

It acts as National Point of Contact for all international data exchanges concerning PTI, including the contacts with Vehicle Manufacturers. It also has the possibility to control the access of PTI centres to VM's in order for testing inspectors to get PTI Technical data.

2. **Roles and responsibilities**

- Enforcement of EU and national PTI regulations for all type of vehicles.
- Authorise testing centres and PTI inspectors to perform PTI. In that scope, PTI testing centres access control to VM's sites can be under their control.
- Collect and keep RW certificates in a centralised database.
- Ensures correct information is forwarded/made available to relevant stakeholders.
- Acts as the national contact point for PTI data exchange.
- Owns the national centralised PTI database.

3. **Communication**

The following table identifies with which stakeholders the PTI authority communicates with, the purpose and what kind of data are exchanged.

With who	Purpose	What	Comment
Registration authority	Register a vehicle Enforce PTI result (suspension of registration / lifting of suspension)	RW certificate	National / International
PTI centres	Collects RW certificates Provide access to VM's PTI technical data	RW certificate Access rights and fees	National/ International International
Vehicle manufacturers	Perform PTI Provide access to VM's PTI technical data	PTI Technical information Access rights	International

Table 8-24: PTI authority communication channels

8.10.3.3 PTI centres

1. **Description**

PTI centres perform PTI tests on all concerned vehicles. Those services can be delivered by private or public companies which are authorised by the MS' competent authority (RW package, PTI, Art. 12) [D1]. Those services can occur at specific inspection centres or at workshops (garages).

Currently, PTI centres act at national level. In the view of a possible full mutual recognition of PTI across the EU, PTI centres should have the possibility to perform PTI on any vehicle registered in the EU. In this regard, PTI centres will need to exchange data with competent authorities from other MS.

2. **Roles and responsibilities**

- Performs PTI tests based on processes defined by the national and EU legislation.
- Issues RW certificate to the registration holder.
- Transmits RW certificates to the national PTI authority as per legal basis.

3. Communication

The following table identifies with which stakeholders PTI centres communicate with, the purpose and what kind of data are exchanged.

With who	Purpose	What	Comment
PTI authority	Reporting RW certificates Perform PTI.	RW certificate Access rights to VM's PTI technical information	National International
Registration authority	Perform PTI.	CoC technical data	National
Vehicle manufactures	Perform PTI	Access rights, PTI Technical data	International

Table 8-25: PTI centres communication channels

8.10.3.4 RSI authority

1. Description

The national RSI authority is public service acting at national level. This authority is responsible for the enforcement of EU and national regulations concerning RSI for all concerned vehicles. It supervises RSI inspectors. It is also responsible for collecting all RSI related data (RSI reports and notifications for additional technical inspections).

2. Roles and responsibilities

- Performs risk analysis in order to identify which vehicle should undergo RSI.
- Ensures RSI is performed as per legal basis.
- Communicates RSI reports and notifications to other Member States' competent authorities.
- Own all data concerning RSI, including risk analysis, RSI reports and notifications to other Member State's relevant authorities.
- Provide EU institutions with bi-yearly reports.

3. Communication

The following table identifies with which stakeholders RSI authority communicate with, the purpose and what kind of data are exchanged.

With who	Purpose	What	Comment
RSI inspector	Centralise RSI reports Select vehicle to inspect	RSI reports Risk rate	National

With who	Purpose	What	Comment
PTI Authority	Verify previous RW certificate Notify and follow-up on additional – technical inspections to be performed on vehicles	RW certificate RSI Report, RSI notifications	National / International
Other MS' RSI authority	Get/calculate risk rate Send RSI report and notification for requesting measures	Risk rate RSI report and notification for requesting measures	International
EU institutions	Report on RSI activities.	RSI national statistics (overview and detailed)	International

Table 8-26: RSI authority communication channels

8.10.3.5 RSI inspector

1. Description

RSI inspectors perform roadside inspection under the mandate of the National Roadside Inspection authority. One of the selection criteria of vehicles to be inspected is the undertaking's risk score provided by the RSI authority at the latest at the time of stopping the vehicle.
These inspectors are members of different stakeholders, authorities depending on the Member States' organisation. They can be part of the Police, PTI dedicated staff, RSI authority…

2. Roles and responsibilities

- Perform Roadside Inspection of the vehicle.
- Check the previous RW certificate.
- Record and send the RSI report to RSI National authority.
- Request for measures to be taken if needed.

3. Communication

The following table identifies with which stakeholders RSI inspectors communicate with, the purpose and what kind of data are exchanged.

With who	Purpose	What	Comment
RSI authority	Select vehicles to inspect Centralise RSI reports Request for measures to be taken	Risk rate RSI report RSI notifications for requesting measures	National / International
PTI authority	Verify previous RW certificate	RW certificate	National/ International

Table 8-27: RSI inspectors' communication channels

8.10.3.6 Accident information provider

1. Description

The accident information provider acts at national level.
In order to provide anonymised information on accidents in the scope of the VIP, relevant technical data on odometer readings and main safety-related equipment implemented on vehicles involved in serious accidents has to be recorded.
In order to provide information on vehicle history, vehicle accident history has to be provided to the registration authority.
At the time of writing, this stakeholder does not exist as such and should be appointed.

Because this information is not purely related to PTI and RSI, only international data exchanges are taken into account as defined in the new RW package.

2. Roles and responsibilities

- Provide anonymised accident data to the registration owner, accident researchers and PTI inspectors.
- Provide accident history to the registration authority.

3. Communication

The following table identifies with which stakeholders Accident information providers communicate with, the purpose and what kind of data are exchanged.

With who	Purpose	What	Comment
Registration owner, accident researchers	Accident researches	Anonymised accident data	National / International
Registration authority	Consumer protection	Vehicle accident history	National / International
PTI Centres	Testing of vehicles involved in serious accidents	Anonymised accident data	National / International

Table 8-28: Accident information providers' communication channels

8.10.3.7 Vehicle manufacturer

1. Description

Vehicle manufacturers are private companies acting at international level.
Vehicle manufacturers own all technical data concerning a vehicle they have produced. They provide a CoC for each vehicle which is sold in the EU as part of the registration process.
VM's already provide technical information via web-site to workshops for repair and maintenance purposes (RMI).
Vehicle manufacturers are information providers only.

2. Roles and responsibilities

- Issue the Certificate of Conformity for each vehicle sold in the EU.
- Provide complete data set of data included in the CoC.
- Provide data necessary for testing the functionalities of safety and environmental related electronic components.
- Own all vehicle technical data, including CoC data.

3. Communication

The following table identifies with which stakeholders Vehicle manufacturers communicate with, the purpose and what kind of data are exchanged.

With who	Purpose	What	Comment
Registration authorities	Issue the registration document including technical data Have CoC technical data available for PTI centres	CoC	International
PTI authorities	Make PTI Technical data available for PTI Centres Control access to VM PTI information	Vehicle PTI Technical data Access control	International
PTI Centres	Make PTI Technical data available for PTI Centres Control access to VM PTI information	Vehicle Technical data Access control	International
Test equipment providers	Set-up and maintain PTI testing equipment for ECU	ECU PTI technical data	International

Table 8-29: Vehicle manufacturers' communication channels

8.10.3.8 Vehicle testing equipment provider

1. Description

Testing equipment manufacturers are private companies acting at international level.
Vehicle testing equipment manufacturers provide testing centres and garages with vehicle testing equipment. They need vehicle technical data in order to set-up, test and maintain their vehicle testing equipment.
They have the obligation to maintain the testing facilities and equipment in accordance with the specifications provided by the manufacturer[3,4,5].

2. Roles and responsibilities

- Provide testing centres and garage with vehicle testing equipment, including testing equipment testing the functionalities of electronic equipment.
- Set-up the equipment, validate they measure the correct value and provide correct test results.
- Maintain testing facilities and equipment in accordance with the specifications provided by the vehicle manufacturer.

3. Communication

The following table identifies which stakeholders the current one is in communication with, the purpose and what kind of data are exchanged.

With who	Purpose	What	Comment
Vehicle manufacturers	Set-up and maintain PTI testing equipment	Equipment technical data, PTI technical data	International

Table 8-30: Vehicle testing equipment provider communication channels

8.10.3.9 European institutions

1. Description

EU institutions are public services acting at international level.
Statistical data are part of the sources used by the European institutions for legislation making. Legislations often include Member States' reporting and statistics requirements towards EU institutions.

2. Roles and responsibilities

- Create legislation at EU level.
- Performs data analysis from Member States reports and statistics for further policy making.
- Follows-up on VIP performance and usage through reports provided by the VIP operator.

3. Communication

The following table identifies which stakeholders the current one is in communication with, the purpose and what kind of data are exchanged.

With who	Purpose	What	Comment
RSI Authorities	Statistics and reports, policy making	Statistics and reports on RSI	International
Accident information provider	Statistics and reports, follow-up on security measures, accident researches	Anonymised accident data	International
VIP Operator	Follow-up on VIP usage and performance	VIP usage statistics	International

Table 8-31: European institutions communication channels

8.10.3.10 VIP operator

1. Description

The VIP operator is responsible for the operations and maintenance of the Vehicle Information platform. This includes the on-line monitoring, back-up and disaster recovery, providing usage statistics to the owner of the system. It is assumed that these activities are part of the common implementation and operation of any IT system.

2. Roles and responsibilities

- Operate the VIP on a day-to-day basis, including on-line monitoring
- Responsible for system maintenance, including back-up and restore operations
- Responsible for user support and follow-up on incidents.
- Provides the VIP usage reports and statistics to the EU institutions.

Day-to-day operations, monitoring, system maintenance and user support are part of the global operations of any IT system. , and are not further considered in this report. They are considered to be implemented.

The provision of statistic reports of the VIP usage to the European Institutions is indirectly mentioned in the directive. That's why this single responsibility is taken into account in this study.

3. Communication

The following table identifies which stakeholders the current one is in communication with, the purpose and what kind of data are exchanged.

With who	Purpose	What	Comment
EU institutions	Follow-up on performance and usage of the system	System usage statistics and reports	International
End users	User support	Incidents	International

Table 8-32: VIP operator communication channels

User support is considered to be part of the common operation for any IT system and is not further considered in this study.

The following table summarises the identified stakeholders, together with the type of services they provide and their level of activity or authority.

ID	Name	Type of services (Government-Public / private)	Level of Authority or activity (national, international, EU)
ST 01.	Registration Authority	Public	National
ST 02.	PTI authority	Public	National
ST 03.	PTI centre	Private/Public	National
ST 04.	RSI authority	Public	National
ST 05.	Roadside Inspector	Private/Public	National
ST 06.	Accident information provider	N/A	National
ST 07.	Vehicle Manufacturer	Private	International
ST 08.	Vehicle Testing Equipment Provider	Private	International
ST 09.	EU Institutions	Public	EU
ST 10.	VIP operator	Public	EU

Table 8-33: Summary of VIP stakeholders

8.10.4 Functionalities

This section describes functionalities identified in the scope of the registration, PTI and RSI processes with regards to the new RW package. Depending on the international data exchange needs each activity has been assessed being part of the VIP or not.

8.10.4.1 Functionalities in the scope of registration

Activities linked to registration concern all identified activities related to the first registration, the re-registration, recording vehicle modification and vehicle end-of-life recording. These activities are all performed by the registration organisation of each Member State.

	Activities to be performed	VIP related use case
1.	Store registration data in national register.	Not covered by VIP (national level).
2.	Retrieve CoC from vehicle manufacturer and store it in the national register.	Not covered by VIP (see section 4.6)
3.	Verify previous registration certificate.	Not covered by VIP (out of scope of VIP, already covered by EUCARIS).
4.	Perform law enforcement checks.	Not covered by VIP (out of scope).
5.	Retrieve and store CoC from previous registration.	UC01: Get/communicate CoC data.
6.	Retrieve and store vehicle historical data from previous registration	UC 11: Get/communicate vehicle historical data.
7.	Verify latest RW certificate.	UC07: Get/communicate RW certificate from/to other MS competent authorities.
8.	Store RW Certificate in the relevant national register and enforce PTI result (suspension of registration / lifting of suspension)	Not covered by VIP (national level).
9.	Record a vehicle has been modified	Not covered by the VIP (national level).
10.	Send/Retrieve vehicle history	UC11: Get/communicate vehicle historical data.
11.	Record a vehicle has been treated as end-of-life.	Not covered by the VIP (national level).
12.	Suspend / cancel vehicle registration	Not covered by the VIP (national level).
13.	Notify the registration authority about vehicle end-of-life.	UC02: Notify a vehicle end-of-life

Table 8-34: List of activities to be performed in the scope of registration

8.10.4.2 Functionalities in the scope of periodical technical inspection

In the scope of the PTI process, 2 main activities have been identified:

- Set-up and maintain testing tools.
- Execute periodic technical inspection.

8.10.4.2.1 Set-up and maintain testing tools

These activities are performed by test equipment providers in order to set-up and maintain their testing tools.

	Activities to be performed	VIP related use cases
1.	Retrieve equipment technical PTI data from VM.	UC04: Obtain equipment technical data
2.	Retrieve vehicle specific PTI technical data from VM.	UC05: Obtain vehicle specific PTI technical data

Table 8-35: List of activities to be performed in the scope of PTI – set-up and maintain testing tools

8.10.4.2.2 Execute periodic technical inspection

In order for PTI centres to perform technical inspections according to the new RW package, following activities have been identified:

	Activities to be performed	VIP related use cases
1.	Verify registration data.	Not covered by VIP (out of scope of VIP).
2.	Verify latest RW Certificate.	UC07: Get/communicate RW certificate to/from other MS competent authorities
3.	Retrieve CoC technical data for the purpose of PTI execution.	UC06: Get CoC technical data
4.	Retrieve vehicle specific PTI technical data from vehicle manufacturers for the purpose of PTI execution.	UC05: Obtain vehicle specific PTI technical data
5.	Store RW Certificate in the national register.	Not covered by VIP (national level).

Table 8-36: List of activities to be performed in the scope of PTI execution

8.10.4.3 Functionalities in the scope of roadside inspection

In order for roadside inspectors and RSI authorities to perform technical inspections with respect of the new RW package, following activities have been identified:

	Activities to be performed	VIP related use cases
1.	Verify undertaking's risk rate	UC14: Get/communicate undertaking' s risk rate from/to other MS's RSI authorities
2.	Verify registration data.	Not covered by VIP (out of scope of VIP).
3.	Verify latest RW Certificate.	UC07: Get/communicate RW certificate to/from other MS competent authorities
4.	Verify previous RSI report.	UC08: Get/communicate (previous) RSI report from/to MS competent authority
5.	Record RSI report.	Not covered by VIP.
6.	Send 'negative' RSI report to competent authorities.	UC08: Get/communicate (previous) RSI report from/to MS competent authority
7.	Notify other MS competent authority on measures to be taken	UC09: Notify MS competent authority on measures to be taken
8.	Send bi-yearly statistics on RSI to EU institutions	UC10: Send national RSI statistics to EU institutions

Table 8-37: List ofactivities to be performed in the scope of RSI

8.10.4.4 Functionalities in the scope of accident information

The new RW package requires accident data to be transmitted in order to perform statistics on safety equipment of vehicles involved in serious accidents. The following activities related to the VIP have been identified:

	Activities to be performed	VIP related use cases
1.	Record vehicle accident data.	Not covered by VIP (national level).
3.	Provide list of accidents for a VIN	Not covered by VIP (national level).

Table 8-38: List of activities to be performed in the scope of accident data

8.10.4.5 Administrative and reporting functionalities

Below activities are not related to each other but due to their nature they are presented in the common list.

	Activities to be performed	VIP related use cases
1.	Setup of access rights for PTI centres to VM technical information (depending from national setup).	UC03: Get access to VM's technical data information
3.	Operate and monitor the VIP.	Not detailed by the study as these are considered to be part of the day-to-day operational activities by the operator.
4.	Generate and make available statistics on VIP usage.	UC13: Provide VIP usage reports and statistics

Table 8-39: List of activities to be performed in the scope of administrative and reporting functionalities

The operation and monitoring of the VIP are part of the standard implementation of any IT system and is needed in order to provide usage reports and statistics. This activity is noted to be 'not covered by the study' in the sense of international data exchange. Instead, the generation of statistics is covered by the VIP because it concerns international data exchange with the EU institutions.

8.10.5 Use cases

The following table gives an overview of the use cases. The columns 'PTI, RSI, REG, Accidents and EU indicate whether the use-case concerns these business processes.

ID	Use case name	PTI	RSI	Registration	Accidents	EU
UC01	Get/communicate CoC data			Y		
UC02	Notify a vehicle end-of-life.			Y		
UC03	Get access to VM's technical data information	Y				
UC04	Obtain equipment technical data	Y				
UC05	Obtain vehicle specific PTI technical data	Y				
UC06	Get CoC technical data	Y				
UC07	Get/communicate RW certificate from/to other MS competent authorities	Y		Y		
UC08	Get/communicate (previous) RSI report from/to MS competent authority		Y	Y		
UC09	Notify MS competent authority on measures to be taken		Y	Y		
UC10	Send national RSI statistics to EU institutions		Y			Y
UC11	Get/communicate vehicle historical data	Y	Y	Y	Y	
UC12	Provide anonymised data on accidents and odometer readings				Y	Y
UC13	Provide VIP usage reports and statistics					Y
UC14	Get/communicate undertaking' s risk rate from/to other MS's RSI authorities		Y			

Table 8-40: List of VIP use-cases

The following is a high-level description of the identified use-cases. Because each Member State has its own organisation, the description takes into account the stakeholders identified and described in sections 4.2.2 and 8.10.3. More details on data entities may be found in section 4.2.1.

8.10.5.1 UC01: Get/Communicate CoC data

1. **Objective**
   - As part of the registration process, registration authorities are required to record the CoC of the registered vehicle. This CoC data is transmitted to the registration authorities of other MS in case of re-registration; the process is synchronous AND occurs at international level.
2. **Stakeholders involved**
   - Registration authority
3. **Data entities involved**
   - CoC.
4. **Input**
   - VIN.
   - Previous licence plate nr / issuing MS.
5. **Output**
   - N/A
6. **Main steps of the process**
   - The registration authority of re-registration Member State sends a request to the previous registration authority.
   - The previous registration authority collects and sends all CoC data to the requestor.
7. **Requirements**
   - FR06: Exchange of:
     - Registration data,
     - CoC,
     - RW Certificate,
     - Technical data for PTI.

8.10.5.2 UC02: Notify a vehicle end-of-life

1. **Objective**
   - Notify the registration authority of the registration Member State when a vehicle has been treated/recorded as end-of-life in other MS.
   - This process is synchronous and occurs at international level.
2. **Stakeholders involved**
   - Registration authorities.
3. **Data entities involved**
   - Vehicle end-of-life notification.
4. **Input**
   - Vehicle end-of-life notification.
5. **Output**
   - N/A.

6. **Main steps of the process.**
    - The registration authority of the MS where vehicle was treated as end-of-life sends an end-of-life notification to the registration authority of the Member State where vehicle was registered.
7. **Requirements**
    - FR17: End-of-life notification.

8.10.5.3 UC03: Get access to VM's technical data information

1. **Objective**
    - Provide access for PTI centres to the vehicle manufacturers' PTI technical information website. This access can be direct or granted through national PTI Authority. In such case national PTI Authority is responsible for provision of such access for PTI centres.
    - This process is synchronous.
2. **Stakeholders involved**
    - PTI authority;
    - PTI centres;
    - Vehicle manufacturers ;
    - Test equipment providers.
3. **Data entities involved**
    - PTI centre information.
4. **Input**
    - PTI centre information.

5. **Output**
    - Access provided.
6. **Pre-requisites**
    - Contract exists between MS' PTI authority and VM.
7. **Main steps of the process**
    - Scenario 1: access through national authority (PTI centres)
        - PTI centre requests access to the VM PTI website through PTI authority.
        - PTI authority checks authentication and authorisation for access to VM's website.
        - PTI authority grants the access to the VM's PTI website.
    - Scenario 2: direct access (PTI centres and test equipment providers)
        - PTI centre or Test equipment provider requests access to the VM PTI website.
        - VM PTI site checks authentication and authorisation for access to VM's website.
        - VM PTI site grants the access to the VM's PTI data site.
8. **Requirements**
    - FR01: Exchange additional technical data for the purpose of PTI.
    - FR02: Exchange PTI and RSI data.

8.10.5.4 UC04: Obtain equipment technical data

1. **Objective**
    - In order to set up and maintain their test tools, test equipment providers need technical information related to specific equipment.
    - This process is synchronous and occurs at international level.
2. **Stakeholders involved**
    - Testing equipment providers.
    - Vehicle Manufacturers.
3. **Data entities involved**
    - Equipment technical data.
4. **Input**
    - Equipment type and version.
5. **Output**
    - Equipment technical data.
6. **Pre-requisites**
    - Testing equipment provider has access to the VM PTI website.
7. **Main steps of the process**
    - Testing equipment provider user enters the Equipment type and version.
    - All PTI technical information is displayed on the screen, including possible downloads needed for the test tool.
8. **Requirements**
    - FR01: Exchange additional technical data for the purpose of PTI.
    - FR02: Exchange PTI and RSI data.

8.10.5.5 UC05: Obtain vehicle specific PTI technical data

1. **Objective**
   - In order to test the functionalities of electronic controlled units (ECU) of a vehicle, PTI centres need specific information related to the equipment implemented on that specific vehicle. This information is available at VM's PTI websites.
   - This process is synchronous and occurs at international level.
2. **Stakeholders involved**
   - PTI Centre.
   - VM.
3. **Data entities involved**
   - Vehicle PTI technical data.
4. **Input**
   - VIN.
5. **Output**
   - Vehicle PTI technical data.
6. **Pre-requisites**
   - PTI Centre has access to the VM PTI website.
7. **Main steps of the process**
   - PTI Centre enters the VIN of the vehicle.
   - All PTI technical information is displayed on the screen, including possible downloads needed for the test tool.
8. **Requirements**
   - FR01: Exchange additional technical data for the purpose of PTI.
   - FR02: Exchange PTI and RSI data.

8.10.5.6 UC06: Get CoC technical data

1. **Objective**
   - In order to perform PTI, testing centres need technical data that are part of the CoC. This part of data is stored by the registration authorities at vehicle registration.
   - This process is synchronous and occurs at national and international level.
2. **Stakeholders involved**
   - Registration authorities.
   - PTI centres.
3. **Data entities involved**
   - CoC technical data.
4. **Input**
   - VIN.
   - Licence plate/issuing Member State.
5. **Output**
   - CoC technical data.
6. **Pre-requisites**
   - N/A.

7. **Main steps of the process.**
    - PTI centre sends a request to the registration authority containing the VIN or the licence plate and issuing Member State.
    - The registration authority sends the CoC technical data to the testing centre.
8. **Requirements**
    - FR06: Exchange of:
        - Registration data,
        - CoC,
        - RW Certificate,
        - Technical data for PTI.

8.10.5.7 UC07: Get/communicate RW certificate to/from other Member State competent authorities

1. **Objective**

    Communicate RW certificate to other Member State competent authorities for the following:

    - Re-registration
    - RSI

    In respect with future mutual recognition, RW certificate could also be exchanged with PTI authorities and centres.

    This process is synchronous.
1. **Stakeholders involved**
    - National authority issuing the RW certificate:
        - National PTI responsible authority or testing centre.
    - National competent authority needing RW certificates, being one of the following
        - Registration authorities.
        - PTI national responsible authorities.
        - RSI national responsible authorities.
2. **Data entities involved**
    - RW certificate.
3. **Input**
    - VIN.
    - License plate/Member State.
4. **Output**
    - RW certificate.
5. **Pre-requisites**
    - N/A.
6. **Main steps of the process**
    - Requesting Member State Authority sends the VIN and/or previous Licence plate/MS to issuing Member State.
    - Issuing Member State retrieves the last RW certificate and sends it to the requesting Member State.

7. **Requirements**
    - FR04: Link existing systems.
    - FR05: Mutual recognition of PTI.
    - FR06: Exchange of:
        - Registration data;
        - CoC;
        - RW Certificate;
        - Technical data for PTI.
    - FR07: Electronic exchange of RW Certificates.
    - FR08: Send RW Certificate after PTI with accompanying optional information about vehicle use suspension.
    - FR09: Check RW Certificate during RSI.
    - FR15: Possibility to check RW certificate during re-registration.
    - FR16: Possibility to retrieve previous RW Certificate.

8.10.5.8 UC08: Get/communicate RSI report from/to MS competent authority

1. **Objective**
    - Check the previous RSI report.
2. **Stakeholders involved**
    - RSI authorities.
3. **Data entities involved**
    - RSI report.
4. **Input**
    - Vehicle License plate number / Member State of registration.
5. **Output:**
    - RSI report.
6. **Pre-requisite:**
    - The vehicle is registered in one of the Member States
7. **Main steps of the process**
    - Requesting RSI authority sends the License plate and Member State of registration to the RSI authority of the Member State of registration
    - The RSI authority of the Member State of registration retrieves the latest RSI report and sends it to the requestor.
8. **Requirements**
    - FR02: Exchange PTI and RSI data.
    - FR10: Check previous RSI report during RSI.

8.10.5.9 UC09: Notify MS competent authority on measures to be taken

1. **Objective**
   - In case major or dangerous defects have been identified on a vehicle during RSI, RSI authority may request RSI authority from the Member State issuing the vehicle registration certificate to take measures regarding that vehicle. The notification is send together with the RSI report.
   - This process is asynchronous and occurs at international level.
2. **Stakeholders involved:**
   - RSI responsible authorities.
3. **Data entities involved**
   - RSI notification for requesting measures to be taken.
   - RSI report
4. **Input:**
   - RSI notification for requesting measures to be taken.
5. **Output**
   - N/A.
9. **Pre-requisites**
   - The RSI had identified major/dangerous defects on the vehicle.
   - RSI report is available
   - The vehicle is registered in one of the Member States.
6. **Main steps of the process:**
   - The RSI responsible authority requesting measures sends the notification and the RSI report to the RSI responsible authority of the Member State of registration.
7. **Assumption**
   - This request is linked to the relevant RSI report.
8. **Requirements**
   - FR11: Send RSI test report in case of major or dangerous deficiencies.
   - FR12: Send RSI notification to take appropriate follow-up action in case of major or dangerous deficiencies.
9. **Note**

   Although this is not mentioned in the new legislation, the relevant authority of the Member State of registration should inform the issuing authority of the follow-up of the request. The same use-case may be used for this purpose, with different type of notification.

8.10.5.10 UC10: Send national RSI statistics to EU institutions.

1. **Objective**
   - As per EU regulation, Member States are required to send bi-annual statistics to the EU Institutions. The EU institutions use these statistics as input for follow-up and further policy making.
   - This process is asynchronous and occurs at international level.
2. **Stakeholders involved**
   - RSI responsible authorities.
   - EU institutions.

3. **Data entities involved**
    - RSI national statistics – overview.
    - RSI national statistics – detailed.
4. **Input**
    - Reporting period.
5. **Output**
    - RSI national statistics – overview.
    - RSI national statistics – detailed.
6. **Main steps of the process**
    - The MS RSI responsible authority:
        - Collects the information and prepares the reports for the reporting period
        - Sends the report to the EU institutions.
7. **Requirements**
    - FR13: Bi-yearly RSI statistics for Commission.

8.10.5.11 UC11: Get/communicate vehicle historical data

1. **Objective**
    - Provide a list of events that occurred to the vehicle throughout its life-cycle, as from its first registration. This process can be synchronous or asynchronous and occurs at international level.
2. **Stakeholders involved**
    - Registration authority.
3. **Data entities involved**
    - Vehicle historical data.
4. **Input**
    - VIN.
    - Vehicle Licence plate number and issuing Member State.
5. **Output**
    - Vehicle historical data.
6. **Pre-requisites**
    - Vehicle historical data is available for the registration authority
7. **Main steps of the process**
    - The requestor Member State sends the VIN nr or the license plate number / Member State of registration to the latest MS of registration.
    - The requested registration authority sends the complete information to the requesting Member State.
8. **Requirements**
    - FR20: Vehicle historical information for registration holders.

8.10.5.12 UC13: Provide VIP usage reports and statistics

1. **Objective**
   - In order to assess the effectiveness and effects of the implementation of the directive, the EC will submit a report to the EU Parliament and the Council after 6 years from the date of publication of the directive. The production of VIP usage statistics may be an input for this report. Those statistics will also provide a regular follow-up tool on the usage of the VIP.
   - This process is asynchronous and occurs at international level.
2. **Stakeholders involved**
   - EU institutions, including the EU Commission.
   - VIP operator.
3. **Data entities involved**
   - VIP usage data.
4. **Input**
   - Reporting period.
5. **Output**
   - VIP usage statistics for the period concerned.

6. **Main steps of the process**
    - The VIP operator:
        - gathers data from the VIP system and produces the statistics
        - provides the statistics to the relevant instances of the EU institutions.
7. **Requirements**
    - NF08: Usage reporting.

8.10.5.13 UC14: Get/communicate undertaking's risk rate from/to other MS's RSI authorities

1. **Objective**
    - One of the selection criteria of the vehicles to inspect in the scope of RSI is the undertaking's risk rate. The communication of the risk rate occurs at the latest at the moment the vehicle is stopped.
    - This process is synchronous and occurs at national and international level.
2. **Stakeholders involved**
    - RSI authority.
    - RSI inspector.
3. **Data entities involved**
    - Risk rate.
4. **Input**
    - Licence plate number / issuing Member State.
    - Undertaking license number / issuing Member State.
5. **Output**
    - Risk rate.
6. **Main steps of the process**
    - The RSI inspector requests an undertakings risk calculation to the relevant RSI authority.
    - The relevant RSI authority provides the response to the RSI inspector.
7. **Requirements**
    - FR02: Exchange of PTI and RSI data.
    - FR14: exchange risk rates.

8.10.6 Non-functional requirements

Non-functional requirements define criteria related to the implementation and development of a system, the performance, maintenance and operations. From the new RW package, the re-use of existing IT solutions with regards to international data exchange is a strong requirement. In the scope of RSI, the re-use of the ERRU system is specifically mentioned. Concerning the communication with vehicle manufacturers, the VIP should apply the same principles currently in place for the RMI systems set-up by the vehicle manufacturers as well as a single point of access for Member States to these systems.

More detailed information of these requirements may be found in annex 8.10.6 Non-functional requirements.
The following are derived from the new RW package. For each non-functional requirement, the following table provides a requirement identifier, short and complete descriptions and the source of the requirement;

ID	Short description	Description	Source
NF01	Re-use existing IT solutions with regard to international data exchange	"*The Commission shall examine the feasibility, costs and benefits of the establishment of an electronic vehicle information platform by taking advantage of existing and already implemented IT solutions with regard to international data exchange so as to minimize costs and to avoid duplications. The examination shall consider the most appropriate way to link the existing national systems with a view to exchange information on data related to roadworthiness testing and odometer readings between the competent authorities of Member States responsible for testing, registration and vehicle approval, the testing centres, test equipment manufacturers and the vehicle manufacturers.*"	RW package, PTI, Art. 16[3]
NF02	Personal data processing	"*The processing of personal data in the context of this Directive shall be carried out in accordance with Directives 95/46/EC and 2002/58/EC of the European Parliament and of the Council*"	RW Package, Registration document for vehicles[5], Art. 1(3)

ID	Short description	Description	Source
NF03	Re-use of ERRU for RSI notifications and RSI reports.	"*Regulation (EC) No 1071/2009 of the European Parliament and of the Council established the European Register of Road Transport Undertakings (ERRU). ERRU allows national electronic registers of transport undertakings to be interconnected throughout the Union, in compliance with the Union rules on the protection of personal data. The use of that system, operated by the competent authority of each Member State, facilitates cooperation among Member States.* *(…)* *In cases where major or dangerous deficiencies, or deficiencies resulting in a restriction or prohibition on the use the vehicle, are found in a vehicle not registered in the Member State of inspection, the contact point shall notify the results of the inspection to the contact point of the Member State of registration of the vehicle .* *That notification shall contain the elements of the roadside inspection report as set out in Annex IV and shall be communicated preferably through the national electronic register referred to in Article 16 of Regulation (EC) 1071/2009. The Commission shall adopt detailed rules concerning the procedures for the notification of vehicles with major or dangerous deficiencies to the contact point of the Member State of registration in accordance with the examination procedure referred to in Article 23(2)."*	RW package, RSI[4], para 6, (preamble) RW package, RSI[4], Art. 18

ID	Short description	Description	Source
NF04	Re-use of ERRU for risk rate data exchange.	"*For vehicles referred to in points (a), (b) and (c) of Article 2(1), Member States shall ensure that the information concerning the number and severity of deficiencies set out in Annex II and, where applicable, Annex III found on vehicles operated by individual undertakings is introduced into the risk rating system established under Article 9 of Directive 2006/22/EC.* *For the attribution of a risk profile to an undertaking, Member States may use the criteria set out in Annex I. That information shall be used to check undertakings with a high risk rating more closely and more often. The risk rating system shall be operated by the competent authorities of the Member States.* *For the purpose of implementing the first subparagraph, the Member State of registration shall use the information received from other Member States pursuant to Article 18(1).*"	RW package, RSI[4], Art. 6

ID	Short description	Description	Source
NF05	Apply RMI principles for PTI technical data exchange	"3. *In accordance with the principles laid down by Regulation (EC) No 715/2007 of the European Parliament and of the Council1 and by Regulation (EC) No 595/2009 of the European Parliament and of the Council2, the Commission shall, by means of implementing acts, and before 20 May 2018, adopt:* *(a) a set of technical information on braking equipment, steering, visibility, lamps, reflectors, electrical equipment, axles, wheels, tyres, suspension, chassis, chassis attachments, other equipment and nuisance necessary for roadworthiness testing of the items to be tested and on the use of the recommended test methods, in accordance with point 3 of Annex I, and* *(b) the detailed rules concerning the data format and the procedures for accessing the relevant technical information.* *(…)* *The technical information referred to in point (a) of the first subparagraph shall be made available, free of charge or at a reasonable price, by the manufacturers to testing centres and relevant competent authorities, in a non-discriminatory manner.*"	RW package, PTI[3], Art. 4
NF06	Single point of access for PTI technical data	"*The Commission shall examine the feasibility of establishing a single point of access for that technical information.*"	RW package, PTI[3], Art. 4
NF07	Operational logging and monitoring	As part of best practices, the system needs to be monitored for follow-up by the operational team.	

ID	Short description	Description	Source
NF 08	Usage reporting	"*By 30 April 2020, the Commission shall submit a report to the European Parliament and the Council on the implementation and effects of this Directive, in particular as regards the level of harmonisation of periodic roadworthiness tests, the effectiveness of the provisions on its scope, the frequency of testing, the mutual recognition of roadworthiness certificates in cases of re-registration of vehicles originating from another Member State and the results of the examination concerning the feasibility of introducing an electronic vehicle information platform as referred to in Article 16.*"	RW package, PTI[3], Art. 20

Table 8-41: VIP Non-functional requirements

8.10.7 Requirements towards Member States

The following requirements describe Member States' obligations in the scope of the VIP that have been derived from the new RW package. For each requirement, the following table provides a requirement identifier, short and complete descriptions and the source of the requirement

ID	Short description	Description	Source
MR01	Central register storing RW Certificates and odometer readings.	*Data on:* *- current and previous roadworthiness certificates,* *- odometer readings,* *will be centralised by each MS.*	RW package PTI, Art. $8^{3,}$
MR02	RW Certificates has to be available electronically	*Member States shall ensure that the results of the roadworthiness test are notified or made available electronically as soon as possible to the registration authority of the vehicle. That notification shall contain the information mentioned in the roadworthiness certificate.*	RW package, PTI, Art. 8

ID	Short description	Description	Source
MR03	Electronic storage of: - Registration data. - CoC - RW Certificates	*Member States shall record electronically data on all vehicles registered on their territory. The data shall include:* *1) all mandatory elements in accordance with Annex I point II.5 as well as the elements of points II.6 (J) and II.6 (V.7) and (V.9), where this data is available;* *2) other non-mandatory data listed in Annex I or data from the certificate of conformity as provided for in Directive 2007/46, where possible;* *3) the outcome of mandatory periodic roadworthiness tests in accordance with Directive 2014/45/EU [on periodic roadworthiness tests] and the period of validity of the roadworthiness certificate. The processing of personal data in the context of this Directive shall be carried out in accordance with Directives 95/46/EC and 2002/58/EC;* *4) Technical vehicle data shall be made available to the competent authorities or testing centres for the purpose of periodic roadworthiness testing. Member States may limit the use and the dissemination of such data by the testing centres in order to avoid its misuse.*	RW Package, Registration certificates Vehicles, Art. 1 (3)
MR04	Suspension has to be recorded electronically	*The suspension of the use of a vehicle shall be recorded electronically*	RW Package, Registration certificates Vehicles, Art. 1 (4)
MR05	Central storage of RSI reports.	*All the data and information gathered during roadside inspections should be transferred to a common database of the Member State so that the data can be easily processed and information transfer can be performed without additional administrative burden.*	RW Package, RSI para 18 (preamble), RW Package, RSI, Art. 16

ID	Short description	Description	Source
MR06	Vehicle suspension has to be recorded.	*In cases where dangerous deficiencies have been found during a roadworthiness test and the authorisation of a vehicle for use on public roads has been suspended, that suspension should be recorded until the vehicle has passed a new roadworthiness test.*	RW Package, Registration certificates Vehicles, Para 7 (preamble)
MR07	National contact point for PTI related exchanges	*Member States shall designate a national contact point responsible for exchanging information with the other Member States and the Commission with regard to the application of this Directive.*	RW Package, PTI, Art. 15,
MR08	National contact point for RSI related exchanges	*Member States shall designate a contact point which shall:* *– ensure coordination with contact points designated by other Member States as regards actions taken under Article 18;* *– forward the data referred to in Article 20 to the Commission;* *– ensure, where appropriate, any other exchange of information with, and the provision of assistance to, the contact points of other Member States.*	RW Package, RSI, Art. 17,

Table 8-42: VIP requirements towards Member States

8.10.8 VIP legal requirements

The following table enlists the key legal requirements. It reflects important issues that were raised during the interviews and is mainly derived from the key fundamental rights as they shared throughout the EU by the wide array of VIP stakeholders.

The table provides a requirement identifier, short and complete descriptions and the source of the requirement;

ID	Short description	Full description	Source
LR01	Purpose limitation	*The purpose of the VIP information exchange system needs to be clearly specified and adhered to*	Art. 5 of the Treaty on the Functioning of the European Union [12] above
LR02	Respect for the proportionality principle	*The Vehicle Information Platform must comply with the proportionality principle. It should not go beyond what is necessary in order to achieve the objectives of increasing road safety and environmental protection by enabling a seamless flow of information in a cost-effective and efficient manner.*	Art. 5 of the Treaty on the Functioning of the European Union [12] above
LR03	Respect for sensitive and personal data	*The exchange and use of personal data or other sensitive data should be necessary and authorised by legislation*	Art. 8 of the Charter of Fundamental Rights[64 above] National data protection provisions
LR04	Data subject's consent	*The policy related to data subjects' consent to justify the processing of personal data should be defined*	Art. 8 of the Charter of Fundamental Rights[64 above] National data protection provisions
LR05	Information provided to the data subjects	*The responsibilities and the method for providing information to data subjects when requested should be specified*	Art. 8 of the Charter of Fundamental Rights[64 above] National data protection provisions
LR06	Information concerning legal persons	*The manner in which treatment of information related to legal persons is arranged should be specified*	Art 54 of the Treaty on the Functioning of the European Union [12] above

ID	Short description	Full description	Source
LR07	The process for requesting access to data exchanged	*The process by which a data subject can exercise his right to request access to information exchanged about him/her should be specified (this may be at national level, if the data is stored at this level)*	Art. 8 of the Charter of Fundamental Rights[64 above] National data protection provisions
LR08	Data subject right to have their data corrected or deleted	*The process by which the data subject can exercise his or her right to have their exchanged data corrected or deleted should be described (this may be at national level, if the data is stored at this level)*	Art. 8 of the Charter of Fundamental Rights[64 above] National data protection provisions
LR09	Defined technical and organisational security measures	*The way in which appropriate technical and organisational security measures are taken should be defined*	Art. 8 of the Charter of Fundamental Rights[64 above] National data protection provisions
LR10	Secure exchange of personal data	*There should be mechanisms in place for the secure exchange of data that can ensure that the risk of abuse of personal data is minimised*	Art. 8 of the Charter of Fundamental Rights[64 above] National data protection provisions
LR11	Respect for data ownership, trade secrets, patents and copyrights	*There should be a mechanism that can safeguard the necessary respect for data ownership, trade secrets, patents and copyrights*	Art. 345 of the Treaty on the Functioning of the European Union [12 above]
LR12	Freedom of access to and exchange of information	*There should be a mechanism that can safeguard freedom of access to, and freedom of exchange of information*	Art 11 of the Charter of Fundamental Rights[64 above] National freedom of information legislation

ID	Short description	Full description	Source
LR13	Need for a continuous joint clarification of common working rules: VIP legal working group	*There should be a mechanism that can ensure a continuous joint development, interpretation and clarification of common rules.*	EU best practices regarding joint information exchange (e.g. set up of the European Criminal Records Exchange System)
L14	Liability and accountability	*Effective liability arrangements, accountability mechanisms and redress measures should exist for harm caused by VIP*	Art. 47 of the EU Charter of Fundamental Rights[64 above]

Table 8-43: VIP legal requirements

8.11 Responsibilities inside MS

This section describes the responsibilities inside the Member States as well as the possible national data flows. Because each Member State has a different organisation, responsibilities and data flows are discussed as a model from a functional point of view.

8.11.1 Who is responsible for updating the data?

Per default, the data owner is responsible for updating the data. Stakeholder's responsibilities have been described in the section 8.10.3 'Stakeholders description'.

The following table gives an overview of the data provider for data to be exchanged at both national and international level. The data provider is the owner of the data. It is to be noted that PTI technical information is not stored at national level.

Data entities	Data owner
Certificate of Conformity	Provided by: Vehicle Manufacturer Owned by: Registration authority or Other (i.e. Type Approval authority) (this data never changes after the provision)
Certificate of Conformity technical data	Provided by: Vehicle Manufacturer Owned by: Registration authority, Other (i.e. Type Approval authority) (this data never changes after the provision)
Vehicle end-of-life notification	Owned by Registration Authority
Vehicle PTI technical data	Vehicle Manufacturer
Equipment technical data	Vehicle Manufacturer
Roadworthiness certificate	PTI authority
Undertaking Risk rate	RSI authority, Other (i.e. Undertakings authority)
RSI report	RSI authority
RSI notification for requesting measures	RSI authority
Vehicle history	Registration authority
National RSI report - overview	RSI authority
National RSI report - detailed	RSI authority
Vehicle accident data	Accident information provider
VIP usage statistics	VIP operator

Table 8-44: Data entities ownership

The principle is that, except the PTI technical data and equipment technical data, all data related to one vehicle are stored in the Member State of registration.

8.11.2 Which body could host and maintain the interconnection?

According to the new RW package[3],[4],[5] MS are required:

- to establish dedicated contact points for communication related to:
  - Registration,
  - PTI,
  - RSI;
- to have a national centralised, electronic storage for data related to:
  - Registration (in this document called later on: Registration register),
  - Periodical Technical Inspection (PTI register),
  - Roadside inspection (RSI register).

In order to communicate with the VIP, each Member State needs one or more VIP connection points. This connection point is a physical connection enabling a national register to communicate with the VIP. The number of VIP connection points depends on the Member States organisation of the registers and the data flows.

The following figures show two possible national configurations linked to the number VIP connection points. Taking into account the ownership of the data described in the previous section, these figures also show the impact on the data flows between the VIP connection point and the relevant register.

These figures show the different registers and stakeholders as logical entities, without taking into account the national organisation. As previously stated in section 4.6, PTI technical data are not stored at national level.

Single national VIP connection point

In this configuration, all national registers are connected to the same VIP connection point. This means that all international data flows go through that single connection point.

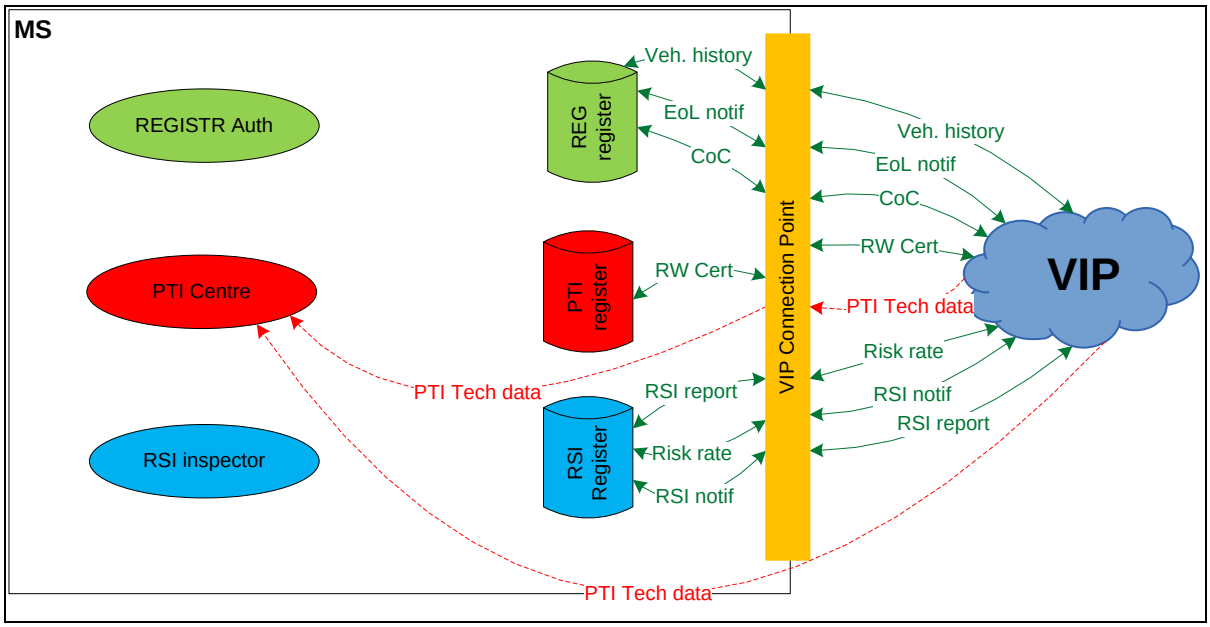


Figure 8-1: Single VIP national connection point

A single authority is responsible for the management of the VIP connection point.

Because PTI technical data is not stored at national level, this data is accessed directly from PTI centres to vehicle manufacturers' registers. Because of the high number of PTI centres, a direct connection from PTI centres to vehicle manufacturers via Internet is required. In that case, no access control occurs by the PTI authorities.

Multiple VIP connection points

In this configuration, each register communicates with the VIP through its dedicated connection point. This means that, in the scope of international data exchange, each data entity belonging to the relevant register will transit through the national VIP contact point belonging to the register as shown.

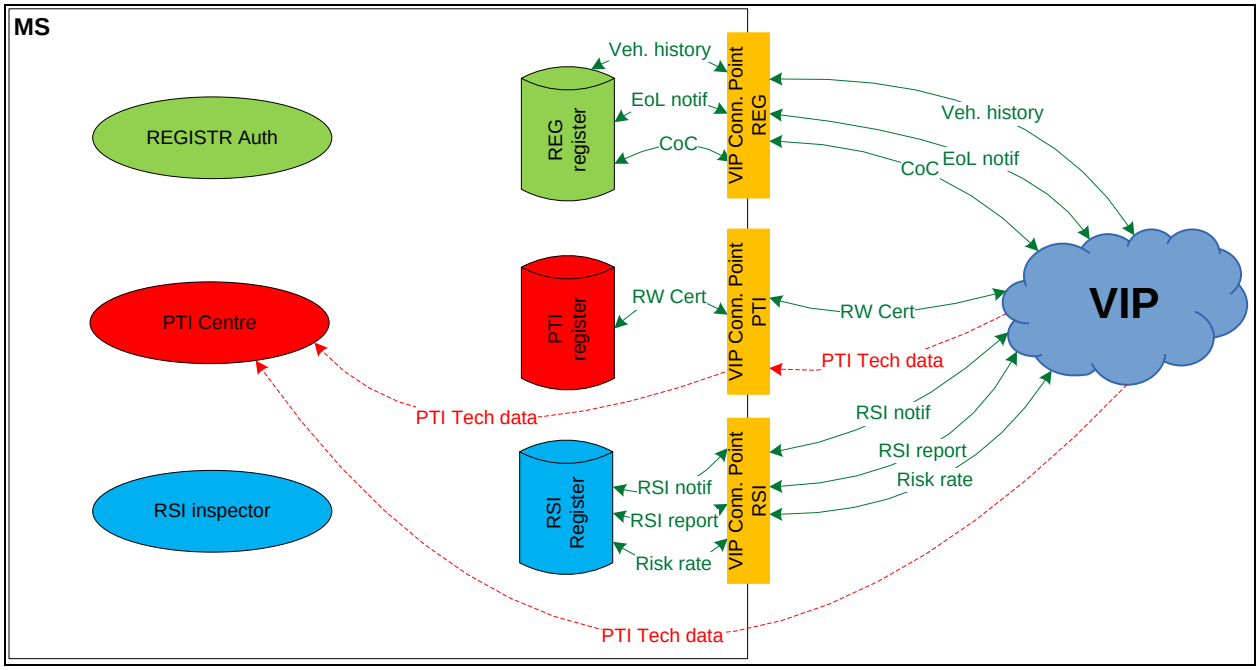


Figure 8-2: Multiple VIP national connection points

In this case, each authority is responsible for its connection point to the VIP.
These examples show two extreme possible configurations. Intermediate configurations grouping some registers and/or connections are possible.

8.11.3 What are the possible national data flows?

This section describes the possible data flows in the scope of registration, PTI and RSI at national level. Because of the numerous possibilities and possible combinations at national level, the following assumptions were taken:

- Each user belongs to a national authority and accesses the system via the national system owned by the relevant authority. Registration officer accesses vehicle information through the registration system, PTI inspector accesses vehicle information via the PTI system and RSI inspector accesses the needed information via the RSI system.
- When data is needed from another register, this data will be available to the user through the system the user is normally connected to. This means that data communication between national registers is in place.
- Data entities are stored in the system owned by the relevant authority based on the table in section 8.11.1.
- PTI technical data needed for PTI activities are not stored at national level as they are owned by the vehicle manufacturers.

8.11.3.1 The national registration flow

The registration flow concerns the following activities (see section 8.10.4.1 Functionalities in the scope of registration'):

- First registration;
- Re-registration;
- Suspension and cancellation of registration
- End-of-life notification

The following data are needed for these activities:

- CoC;
- RW certificate;
- Vehicle history
- Vehicle end-of-life notification

Based on the ownership of these data entities, the following national data flows have been identified.

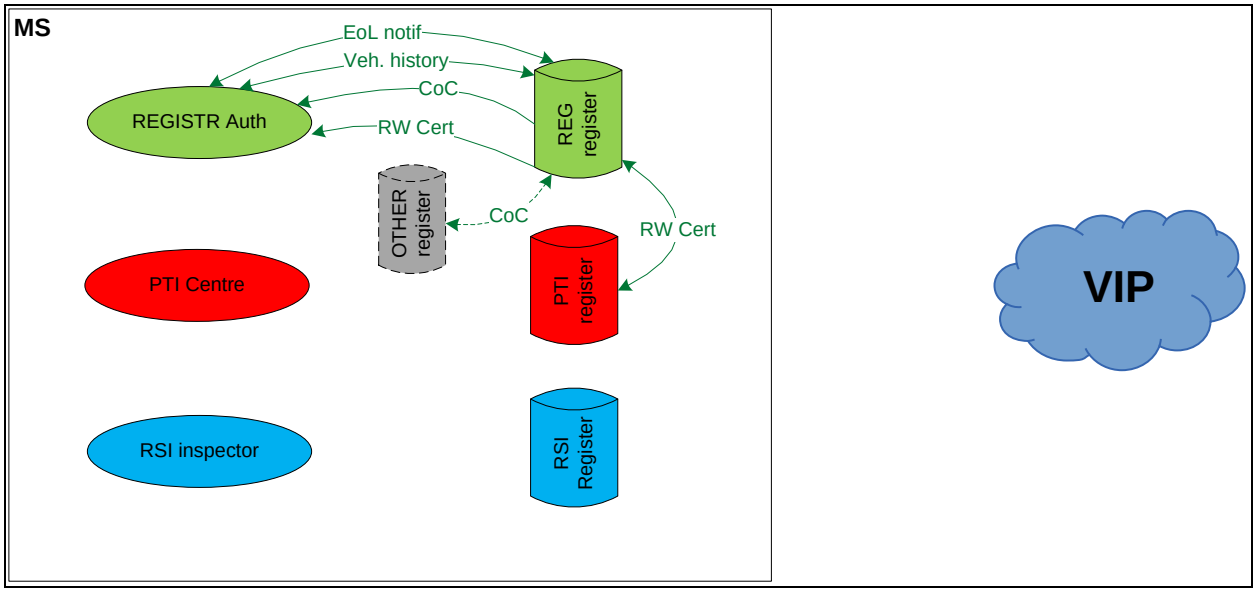


Figure 8-3: Possible national data flows for registration

With the exception of the RW certificate, all data is stored in the registration register and is directly available to the registration authority. RW certificates are owned by the PTI authority and stored in the PTI register. A data flow is needed between the registration register and the PTI register. This flow is bi-directional because in case of re-registration in a new Member State, the latest RW certificate is delivered through the registration authority.

An optional data flow has been identified as CoC can be stored in other registers then the ones owned by the registration authority. This means that CoC data from that other register needs to be exchanged for the registration users via the registration register.

8.11.3.2 The national PTI flow

The national periodic technical inspection data flow concerns the following activities:

- Execute periodic technical inspection (see section 8.10.4.2.2 Execute periodic technical inspection);

The data flow concerns the following data entities:

- CoC technical data;
- RW certificate;
- PTI technical data;

Based on the ownership of these data entities, the following national data flows have been identified.

CoC technical data needed for PTI are transmitted from the registration register to the PTI register in order for the PTI centres to be available at the moment of the PTI. An optional data flow has been identified as CoC can be stored in other registers then the one owned by the registration authority. That's why CoC technical data can be exchanged from another system then the Registration register.

As already stated, PTI technical data is owned by vehicle manufacturers and is not stored in the national register. That's why PTI technical data are accessed by PTI centres via the VIP.

The RW certificate issued after the periodic technical inspection is stored in the PTI register. It also needs to be available for registration authorities. A possible flow is identified between the PTI register and the registration register.

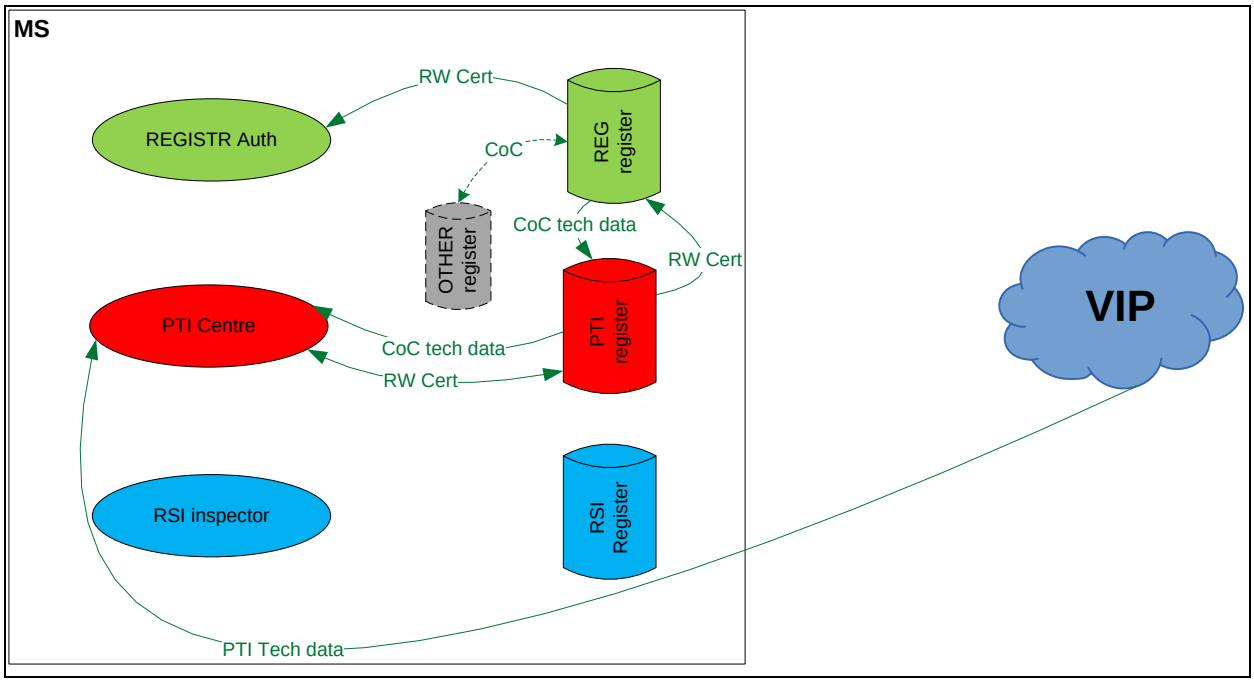


Figure 8-4: Possible national data flows for periodical technical inspection

Currently some bilateral agreements between Member States allow some PTI centres to execute PTI for vehicles registered into another Member State. This is the case between Netherlands and Spain, where Spanish PTI centres perform PTI for vehicles registered in Netherlands, based on the Dutch legislation. According to the subsidiarity principle, at functional level, this flow is considered as a national exchange. Therefore, the same communication channels are used between the PTI centre and the Dutch authorities as it would be located Netherlands.

8.11.3.3 The national RSI flow

The RSI flow concerns the following activities:

- Perform RSI (see section 8.10.4.3 Functionalities in the scope of roadside inspection);

The relevant data flow concerns the following data entities:

- Risk rate.
- RW certificate.
- RSI report.
- RSI notification.

Based on the ownership of these data entities, the following national data flows have been identified. With the exception of the RW certificate, all data are owned by the RSI authority. Because the RW certificate is owned by the PTI authority, a data flow between PTI register and RSI register is needed.

An optional data flow has been identified as risk rate can be stored in another register then the one owned by the RSI authority.

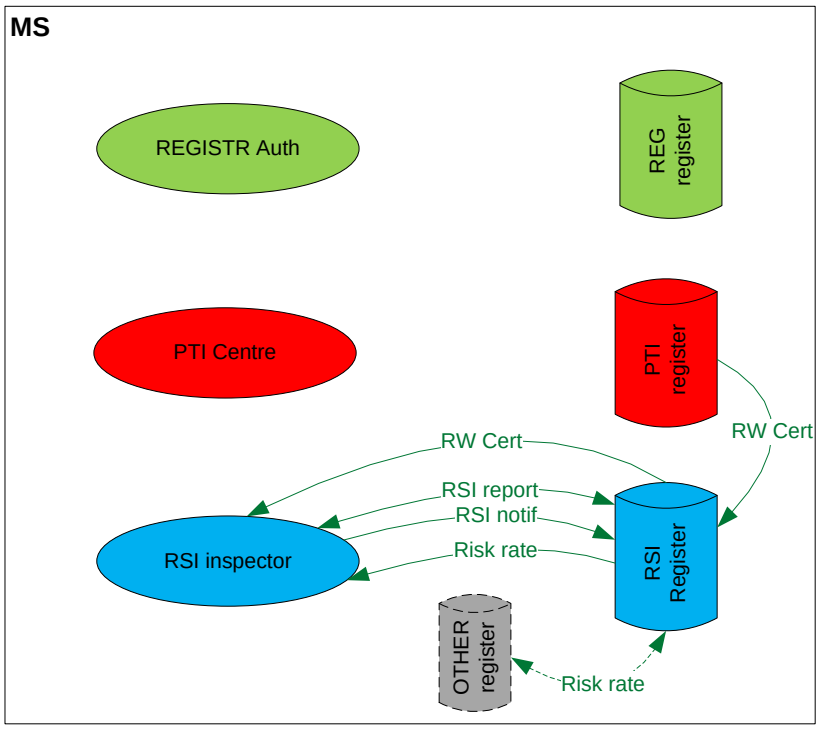


Figure 8-5: Possible national data flows for roadside inspection

As a conclusion, all flows described above show the functional national data flows between the registers and identified users and stakeholders. Each Member State has its proper organisation in order to implement these flows.

This national organisation has an impact on the current national communication channels in place.
Looking for centralisation, one single body can regroup several authorities; one physical system can hold more than one register. Centralisation reduces communication between physical systems and simplifies the communication with the VIP as less connection points are needed.
Looking for decentralization, authorities can be split into several bodies, as well as registers can be split into several physical systems or registers. Decentralisation increases the communication channels between the physical systems. Each register may be connected to the same VIP national connection point, or to a several connection points, increasing the complexity of the communication channels.

8.11.4 Conclusions

Concerning the possible national organisations, the following conclusions can be drawn from above discussions:

1. The national information flows mainly depend from:
    a. The national organisation of the different authorities and registers.
    b. Current communication channels between existing national registers.
2. It seems that the national communication flows can be simplified in case the registration register and PTI register are physically in the same system.

3. National communication flows can be even more simplified in case RSI reports are kept in the same register as RW Certificates.
4. In order to exclude redundancy it is recommended to reuse existing national communication channels.
5. The number of connection points to VIP can vary from Member States to Member State.

    - The maximum connection points to the VIP will be needed in case each register (registration, PTI and RSI register) would need to be connected to its specific VIP connection point.
    - A single VIP connection point means that all registers are connected to the same VIP connection point.
    - In the case all registers are physically centralised, only one system would need to be connected to the VIP connection point.
    - Technically it is possible that only one register is connected to the VIP, providing the relevant services for the VIP connectivity to other national registers.

8.12 Data flows characteristics

For each characteristic, tables are split per business domain:

- Registration business flow
- PTI business flow
- RSI business flow
- VIP usage data

8.12.1 Capacity

Data entity Registration	Size	Frequency (yearly)	Comments
RW Certificate	small (<1 KB)	5 M	Number of vehicles re-registered: According to the European second-hand car market analysis lead by Öko-Institut [79], 3.5 Million cars of category M1 and N1 were imported in 2008.
CoC	Medium (<100 KB)		
Vehicle history	small (<1 KB)		
end-of-life	small (<1 KB)	500 K	Figures are taken from the 'The Vehicle Chain in Europe 2011 - Part I'[80]

Table 8-45: Capacity of international data exchanges related to registration

Data entity PTI	Size	Frequency (yearly)	Comments
RW Certificate	small (<1 KB)	10 K	Number of cars performing PTI abroad (negligible as currently equals 0)
CoC technical data	medium (<100 KB)		
PTI technical data (VIN based)	large (around 1 MB)	Starting from 0 then growing by around 12 M yearly up to 250 M	Total number of all PTIs (for new vehicles). Every year, about 12-15 M first registrations of vehicles occur in the EU[81]. The European vehicle fleet reached over 256 million units in 2008.
Equipment technical data	large (> 1 MB)	30	Only once by each test equipment manufacture - these data is retrieved on demand by test equipment manufactures in order to develop testing tools. It is assumed that if data (relevant technical documentation) is retrieved there

[79] European second-hand car market analysis, Final Report.
[80] E-REG (2011), The Vehicle chain in Europe 2011, a survey of Vehicle and Driving Licence Procedures Part one, of May 2011.
[81] The Vehicle chain in Europe 2011, a survey of Vehicle and Driving Licence Procedures Part one, of May 2011

Data entity PTI	Size	Frequency (yearly)	Comments
			will be no need to retrieve it again.

Table 8-46: Capacity of international data exchange related to PTI

Data entity RSI	Size	Frequency (yearly)	Comments
RW Certificate	small (<1 KB)	2 M	Number of vehicles for which RSI was executed abroad (estimate based on Report from the Commission to the Council and the European Parliament on the application by the Member States of directive 2000/30/EC, reporting period 2011-2012)
Risk rate	small (<1 KB)		
RSI report	small (<1 KB)		
RSI notification	small (<1 KB)		
National RW report overview (RSI)	large (> 1 MB)	½	Bi-yearly - as defined in RW package[4]
National RW detailed report (RSI)	large (> 1 MB)		

Table 8-47: Capacity of international data exchange related to RSI

Data entity Other	Size	Frequency (yearly)	Comments
VIP usage statistics	large (> 1 MB)	13	Weekly, Monthly, yearly (to be further defined)

Table 8-48: Capacity of other data flows

8.12.2 Performance

Data entity Registration	Response time	Comments
RW Certificate	Seconds	Quick response can be needed at registration.
CoC	Seconds	
Vehicle history	Seconds	
end-of-life	Hours	No specific performance requirements.

Table 8-49: Response time for international data exchanges related to registration

Data entity PTI	Response time	Comments
RW Certificate	Seconds	Data need to be retrieved at the moment PTI is performed.
CoC technical data	Seconds	
PTI technical data (VIN based)	Seconds	
Equipment technical data	Hours	No specific performance requirements.

Table 8-50: Response time for international data exchange related to PTI

Data entity RSI	Response time	Comments
RW Certificate	Seconds	Data need to be retrieved at the moment RSI is performed. Risk rate may be retrieved before RSI is performed.
Risk rate	Seconds	
RSI report	Hours	No specific performance requirements.
RSI notification	Hours	
National RW report overview (RSI)	Hours	No specific performance requirements.
National RW detailed report (RSI)	Hours	

Table 8-51: Response time for international data exchange related to RSI

Data entity Other	Response time	Comments
VIP usage statistics	Hours	No specific performance requirements.

Table 8-52: Response time for other data flows

8.12.3 Stakeholders

Data entity Registration	Stakeholders	Comments
RW Certificate	MS ←→MS	Bidirectional data exchange between registration authorities or between registration and PTI authorities.
CoC	MS ←→ MS	Bidirectional data exchange between registration authorities.
Vehicle history	MS ←→ MS	
end-of-life	MS ←→ MS	

Table 8-53: Stakeholders for international data exchanges related to registration

Data entity PTI	Stakeholders	Comments
RW Certificate	MS ←→MS	Bidirectional data exchange between PTI authorities or between registration and PTI authorities.
CoC technical data	MS ←→ MS	Bidirectional data exchange between registration authority and PTI authority.
PTI technical data (VIN based)	VM → MS	PTI centre data retrieval from vehicle manufactures (one direction).
Equipment technical data	VM → Test equipment manufactures	The exchange of information is one direction – from VM to test equipment manufacturers.

Table 8-54: Stakeholders for international data exchange related to PTI

Data entity RSI	Stakeholders	Comments
RW Certificate	MS ←→ MS	Bidirectional data exchange between RSI authority and registration or PTI authorities.
Risk rate	MS ←→ MS	Bidirectional data exchange between RSI authorities.
RSI report	MS ←→ MS	
RSI notification	MS ←→ MS	
National RW report overview (RSI)	MS → EU	One directional exchange - MS provide statistics to EU institution.
National RW detailed report (RSI)	MS → EU	

Table 8-55: Stakeholders for international data exchange related to RSI

Data entity Other	Stakeholders	Comments
VIP usage statistics	VIP → EU	One directional exchange – organisation maintaining the VIP provides statistics to EC.

Table 8-56: Stakeholders for other data flows

8.12.4 Sensitivity of data

Data entity Registration	Sensitive data	Personal data	Comments
RW Certificate	Yes	Yes	Contains personal data of PTI inspector, VIN and odometer value.
CoC	Yes	No	Contains VIN
Vehicle history	Yes	No	If it contains VIN, license plate number or odometer values.
end-of-life	Yes	No	Contains VIN

Table 8-57: Data sensitivity in international data exchanges related to registration

Data entity PTI	Sensitive data	Personal data	Comments
RW Certificate	Yes	Yes	Contains personal data of PTI inspector, VIN and odometer value.
CoC technical data	Yes	No	Contains VIN.
PTI technical data (VIN based)	Yes	No	Contains VIN.
Equipment technical data	No	No	No reference to personal or sensitive data. Protection mechanisms based on intellectual property rights may need to be considered. International exchange may impede on the enforcement of intellectual property rights.

Table 8-58: Data sensitivity in international data exchange related to PTI

Data entity RSI	Sensitive data	Personal data	Comments
RW Certificate	Yes	Yes	Contains personal data of PTI inspector, VIN and odometer value.
Risk rate	Yes	No	Exchanging data related to undertakings is sensitive. It's important to safeguard fair competition
RSI report	Yes	Yes	As it contains name of driver, name of inspector, name of transport undertaking and VIN.
RSI notification	Yes	No	As it contains VIN.
National RW report overview (RSI)	No	No	No reference to personal or sensitive data
National RW detailed report (RSI)	No	No	No reference to personal or sensitive data

Table 8-59: Data sensitivity in international data exchange related to RSI

Data entity Other	Sensitive data	Personal data	Comments
VIP usage statistics	No	No	System usage statistics only

Table 8-60: Data sensitivity in other data flows

8.12.5 Network to be used

Data entity Registration	Internet	Inter-institutional network	Comments
RW Certificate	Yes	Yes (preferred option)	Data can be exchanged on both networks but the preferred option is to use the Inter-institutional network due to its higher security.
CoC	Yes	Yes	No specific requirements identified.
Vehicle history	Yes	Yes (preferred option)	Data can be exchanged on both networks but the preferred option is to use the Inter-institutional network due to its higher security.
end-of-life	Yes	Yes	

Table 8-61: Network for international data exchanges related to registration

Data entity PTI	Internet	Inter-institutional network	Comments
RW Certificate	Yes	Yes (preferred option)	Data can be exchanged on both networks but the preferred option is to use the Inter-institutional network due to its higher security.
CoC technical data	Yes	Yes	No specific requirements identified.
PTI technical data (VIN based)	Yes	No	VM have no access to Inter-institutional network.
Equipment technical data	Yes	No	

Table 8-62: Network for international data exchange related to PTI

Data entity RSI	Internet	Inter-institutional network	Comments
RW Certificate	Yes	Yes (preferred option)	Data can be exchanged on both networks but the preferred option is to use the Inter-institutional network due to its higher security.
Risk rate	Yes	Yes (preferred option)	Data can be exchanged on both networks but the preferred option is to use the Inter-institutional network due to its higher security.
RSI report	Yes	Yes	Data can be exchanged on both networks but the preferred option is to use the Inter-institutional network due to its higher security.
RSI notification	Yes	Yes	Data can be exchanged on both networks but the preferred option is to use the Inter-institutional network due to its higher security.
National RW report overview (RSI)	Yes	Yes	No specific requirements identified.
National RW detailed report (RSI)	Yes	Yes	No specific requirements identified.

Table 8-63: Network for international data exchange related to RSI

Data entity Other	Internet	Inter-institutional network	Comments
VIP usage statistics	Yes	Yes	Needs to be the same network then for VIP-MS

Table 8-64: Network for other data flows

8.13 Current Member States connectivity to existing systems

The table below based on the input from the EC (September 2014), MS during interviews (first quarter of 2014) and EUCARIS (April 2014) presents for each existing system:

- the count of MS currently connected to the system in production use (Production);
- the count of MS planning to connect to the system (Future);
- whether these Member States connect directly or with the use of EUCARIS.

Please note that all Member States are considered, not only the ones participating to the study.

<table>
<tr><th>System name</th><th>Number of Member States connected</th></tr>
<tr><td>TACHOnet</td><td>
<table>
<tr><th></th><th>Direct</th><th>EUCARIS</th><th>Total</th></tr>
<tr><td>Production</td><td>26</td><td>0</td><td>26</td></tr>
<tr><td>Future</td><td>2</td><td>0</td><td>2</td></tr>
<tr><td>Total</td><td>28</td><td>0</td><td>28</td></tr>
</table>
Some non EU countries are connected as well but here they are not taken into account. In total there are 38 countries connected.
</td></tr>
<tr><td>RESPER</td><td>
<table>
<tr><th></th><th>Direct</th><th>EUCARIS</th><th>Total</th></tr>
<tr><td>Production</td><td>1</td><td>4</td><td>5</td></tr>
<tr><td>Future</td><td>2</td><td>18</td><td>20</td></tr>
<tr><td>Total</td><td>3</td><td>22</td><td>25</td></tr>
</table>
For remaining MS it is unknown how they will connect to RESPER in the future.
</td></tr>
<tr><td>ERRU</td><td>
<table>
<tr><th></th><th>Direct</th><th>EUCARIS</th><th>Total</th></tr>
<tr><td>Production</td><td>11</td><td>4</td><td>15</td></tr>
<tr><td>Future</td><td>4</td><td>6</td><td>10</td></tr>
<tr><td>Total</td><td>15</td><td>10</td><td>25</td></tr>
</table>
For remaining MS it is unknown how they will connect to ERRU in the future.
</td></tr>
<tr><td>EUCARIS</td><td>
<table>
<tr><th></th><th>Total</th></tr>
<tr><td>Production</td><td>25</td></tr>
<tr><td>Future</td><td>3</td></tr>
<tr><td>Total</td><td>28</td></tr>
</table>
Above connections are used under various legal basis.
89% of all MS have their registration register connected to EUCARIS but only 35% of all MS are connected (or plan to be connected) to ERRU via EUCARIS
</td></tr>
</table>

Table 8-65: Overview of MS connections to the existing systems exchanging vehicle information data at EU level

8.14 Costs estimates

Cost estimates were calculated using Cost Xpert[82] and cover the software development and maintenance workload only. Relevant monitoring and logging implementation costs are included in the costs estimates. Hardware costs were not taken into account as the reuse of existing platforms is assumed.

Depending on the type of flow, two methods of estimating were used: UML Use Case and Objects.
The common assumptions for all flows are the following:

- The fact that the EU Commission is not neither a professional software development company nor an IT company has been taken into account. This impacts the project quality, project risks, project documentation and project management.
- RUP was assumed to be followed for the methodology and the project lifecycle.

Constraints were taken as follows:

- Customer response times are generally long.
- Requirements are stable.

Because the cost of work hours may change, costs estimates are expressed in workload in terms of person-hours and person-month, taking into account that 1 person-month equals 160 person-hours.

8.14.1 VIP-VM Costs estimates

8.14.1.1 Cost estimates for the EU institutions

Costs estimates using Cost Xpert were done on the following specific assumptions:

- Project type: Internet Web
- Estimation method: UML Use case scenarios, taking as baseline 5 use-cases to be implemented [83]
- Requirement evolution is assumed very low.
- Database size is assumed low.
- Multi-site development was taken into account.
- Internationalisation requirements were assumed very high (whole site has to be multilingual).
- Transaction loads are very high because it is assumed that there is one access per PTI performed.

[82] Cost Xpert is an industry leading software cost estimation tool. It integrates multiple estimation models into one user-friendly solution that provides the most accurate and comprehensive estimates possible. Cost Xpert can be used to forecast any software development project, regardless of size or objective. The tool has been endorsed by both the private and public sector.
[83] UC03: Get access to VM's technical data information, and 4 use-cases for the maintenance of the VIP website: create, read, update and delete the redirection link

With those parameters, the development and maintenance costs as well as duration were estimated as follows:

		Workload # person-hours	Workload # person-months	Duration calendar days
Development		1,144	7.2	105
Maintenance	Year 1	178	1.1	365
	Year 2	157	1.0	365
	Year 3	142	0.9	365
	Year 4	126	0.8	365
	Year 5	138	0.9	365
Total		**1,885**	**11.78**	

Table 8-66: VIP-VM: costs estimates for EU institutions

As shown in the table, the costs of this simple solution are relatively low.

8.14.1.2 Costs estimates for vehicle manufacturers and Member States

Because of insufficient information on the RMI systems, diversity of implementation among vehicle manufacturers, lack of information concerning the data format and structure as well as data needed, costs for vehicle manufacturers and Member States could not be estimated.

8.14.2 VIP-MS Cost estimates

The following table summarises use-cases to be implemented for each option, impacting cost estimates:

UC to be implemented	Option 1 EUCARIS only	Option 2 ERRU only	Option 3 EUCARIS and ERRU		Option 4 (new system)
	EUC.	ERRU	EUC.	ERRU	
UC01- Get/communicate CoC data	Y	Y	Y	Y	Y
UC02- Notify a vehicle end-of-life.	Y	Y	Y	Y	Y
UC06- Get CoC technical data	Y	Y	Y	Y	Y
UC07- Get/communicate RW certificate from/to other MS competent authorities	Y	Y	Y	Y	Y
UC08- Get/communicate (previous) RSI report from/to MS competent authority	Y	Y	Y	Y	Y

UC to be implemented	Option 1 EUCARIS only	Option 2 ERRU only	Option 3 EUCARIS and ERRU		Option 4 (new system)
	EUC.	ERRU	EUC.	ERRU	
UC09- Notify any MS competent authority on measures to be taken	Y	Y	Y	Y	Y
UC11- Get/communicate vehicle historical data	Y	Y	Y	Y	Y
UC14- Get/communicate undertaking' s risk rate from/to other MS's RSI authorities	Y	Y	Y	Y	Y
Total number of UC to be implemented for MS	**8**	**8**	**8 + 8 = 16**		**8**

Table 8-67: VIP-Member States: Options overview

Option 3 considers the implementation of all use-cases in EUCARIS and ERRU in parallel. In case some Member States would request it, only a subset of UC may be implemented in ERRU. The new RW package recommends using ERRU for the following data exchanges (*NF03: Re-use of ERRU for RSI notifications and RSI reports*):

- Risk rate (UC14);
- RSI report (UC08);
- RSI notification (UC09).

On top of this, the RW certificate data exchange (UC07) is a good candidate to be implemented in ERRU because this data exchange is needed by all authorities (registration, PTI and RSI). Some RSI authorities are already connected to ERRU. Not implementing this specific data exchange in ERRU would mean that for these Member States, the implementation of an additional connection would be needed for the purpose of the data exchange of the RW certificate.

Cost estimates have been split into the costs for the EU institutions and costs for Member States.

Costs estimates using Cost Xpert for all four options were done on the following specific assumptions:

- Project type: Internet Web.
- Project lifecycle and project standard: RUP.
- Estimation method: UML Use case scenarios - the number of use-cases taken into account for each option is defined in the further table.
- The following technologies were taken into account:
  - EUCARIS is built in .NET/C#/SQL Server or Oracle. It requires installation on MS sites (peer to peer architecture).
  - ERRU is built in BizTalk and SQL Server (central site).
- Member States integration is required.
- Requirement evolution is assessed as very low.

- Internationalisation requirements are considered low because this is only exchange of the data without impact on the internationalisation of user interfaces.
- Transaction loads are assumed to be very high.

8.14.2.1 Costs for the central development and maintenance

The following tables provide an overview of the estimates costs and duration for the central development and maintenance of each option.

Central development and maintenance costs need to take into account one additional new UC for the provision of VIP usage statistics by the VIP operator (UC13: Provide VIP usage reports and statistics). This new use-case as well as one (1) use-case to be re-used has been added on each system that is extended in the different options.

The total number of UC to be implemented for each option is the following:

Number of use cases	Option 1	Option 2	Option 3	Option 4
New	9	9	18	9
Modified	13	10	23	14

Table 8-68: VIP-MS: Number of UC used for cost estimates for central implementation

Option 1 (EUCARIS only)		Workload # person hours	Workload (# person-months)	Duration calendar days)
Development		5,893	36.8	363
Maintenance	Year 1	917	5.7	365
	Year 2	811	5.1	365
	Year 3	732	4.6	365
	Year 4	649	4.1	365
	Year 5	709	4.4	365
Total		**9,711**	**60.7**	

Table 8-69: VIP-MS: cost estimates for central implementation– Option 1

Option 2 (ERRU only)		Workload # person-hours	Workload # person-months	Duration calendar days
Development		5,238	32.7	333
Maintenance	Year 1	815	5.1	365
	Year 2	721	4.5	366
	Year 3	650	4.1	367
	Year 4	576	3.6	368
	Year 5	630	3.9	369
Total		**8,630**	**53.9**	

Table 8-70: VIP-MS: cost estimates for central implementation– Option 2

Option 3 (full EUCARIS and full ERRU)	Workload # person-hours	Workload # person-months	Duration calendar days

Development		12,133	75.8	562
Maintenance	Year 1	1,850	11.6	365
	Year 2	1,636	10.2	365
	Year 3	1,475	9.2	365
	Year 4	1,309	8.2	365
	Year 5	1,431	8.9	365
Total		**19,834**	**124.0**	

Table 8-71: VIP-MS: cost estimates for central implementation– Option 3

Option 4 (new VIP-MS)		Workload # person hours	Workload # person-months	Duration calendar days
Development		6,362	39.8	346
Maintenance	Year 1	990	6.2	365
	Year 2	875	5.5	365
	Year 3	790	4.9	365
	Year 4	700	4.4	365
	Year 5	765	4.8	365
Total		**10,482**	**65.5**	

Table 8-72: VIP-MS: cost estimates for central implementation– Option 4

The previous tables show that implementing all use-cases on a single system is the most cost effective solution. The difference between option 1, option 2 and option 4 is linked to the number of existing use-cases to be modified. Because of this smaller number on ERRU, option 2 is the most cost effective solution for the central side. Implementing on new system based on ERRU is the less cost effective solution for implementing the VIP-MS on a single system.

Implementing part or all of use-cases on both systems are the most expensive solutions for the central development and maintenance.

8.14.2.2 Cost estimates for Member States

For options 1, 2 and 3 the costs estimates for the Member States are split in 2 parts, depending on the impact of the option chosen on the connectivity of the Member States to the system to be re-used. In case option 1 or 3 is chosen, Member States may reuse their current technical implementation of the connection to EUCARIS (option 1 and option 3) or ERRU (option 3). In case option 2 is chosen, 8 Member States will have to implement a new connection to ERRU and modify the use-cases currently implemented in ERRU, in addition to the new VIP use-cases to be implemented.
In case of option 4 is chosen then all Member States have to implement new connection to the new system. In option 4 this new connection is based on ERRU and TACHOnet architecture so Member States experience with TACHOnet and ERRU would impact costs of its implementation by lowering it.
Cost estimates were executed taking these differences into account.

Costs estimates for Member States using Cost Xpert was done on the following specific assumptions:

- Project type: Internet Web.
- Project lifecycle and project standard: RUP.
- Estimation method: UML Use case scenarios. Depending on the update of the connection to be taken into account, the following table provides the number of the UC to be taken into account

Number of use cases	No connection update	With connection update	New connection
New	8	9	9
Modified	9	15	9

Table 8-73: VIP-MS: number of use-cases for cost estimates.

- No assumptions on the technical environment were made.
- One single VIP connection point per Member State.
- Requirement evolution is assessed very low.
- Internationalisation requirements are considered low because this is only exchange of the data without impact on internationalisation of user interfaces.
- Transaction loads are assumed very high.

With those parameters, development and maintenance costs for each Member State were estimated as follows:

		Member States without connection update		
		Workload # person-hours	Workload # person-months	Duration calendar days
Development		4,955	31.0	281
Maintenance	Year 1	771	4.8	365
	Year 2	681	4.3	365
	Year 3	615	3.8	365
	Year 4	545	3.4	365
	Year 5	596	3.7	365
Total		**8,163**	**51.0**	

Table 8-74: VIP-MS: costs estimates per Member States without connection update

		Member States with connection update		
		Workload # person-hours	Workload # person-months	Duration calendar days
Development		6,740	42.1	363
Maintenance	Year 1	1,048	6.6	365
	Year 2	927	5.8	365
	Year 3	836	5.2	365
	Year 4	741	4.6	365
	Year 5	811	5.1	365
Total		**11,103**	**69.4**	

Table 8-75: VIP-MS: costs estimates per Member States with connection update

		Member States with new connection		
		Workload # person-hours	Workload # person-months	Duration calendar days
Development		5261	32.9	295
Maintenance	Year 1	819	5.1	365
	Year 2	724	4.5	365
	Year 3	653	4.1	365
	Year 4	579	3.6	365
	Year 5	633	4.0	365
Total		**8,669**	**54.2**	

Table 8-76: VIP-MS: costs estimates per Member States with new connection

Depending on the option chosen, the total estimated costs for 28 Member States including 5 years of maintenance are the following:

Option	# MS without connection update	# MS with New connection	# MS with connection update	Workload # pers. - hours	Workload # pers. - months
Option 1 (EUC only)	28	0	0	228,564	1,429
Option 2 (ERRU only)	18	0	10	257,964	1,612
Option 3 (full EUC + full ERRU)	28	0	0	228,564	1,429
Option 4 (new VIP-MS)	0	28	0	242,732	1,517

Table 8-77: VIP-MS: total costs estimates for implementation by 28 Member States

The most cost effective options from Member State development are options 1 and 3 because the existing connection can be re-used. The less cost effective solution is option 2 because 10 Member States will have to implement a new connection to communicate with the ERRU directly.

Because of the high diversity of implementation among Member States, the costs for upgrades of existing hardware platforms were not estimated. Nevertheless, they are considered as small in comparison to the costs of the development related to integration.

8.14.3 VIP-EU Cost estimates

In the scope of VIP-EU, 1 use-case is to be taken into account: UC10 - Send national RSI statistics to EU institutions

8.14.3.1 Cost estimates for Member States

Costs estimates for Member States using Cost Xpert was done on the following specific assumptions:

- Project type: Internet Web.
- Project lifecycle and project standard: RUP.
- Estimation method: UML Use case scenarios. 1 UC has been taken into account (UC10).
- No assumptions on the technical environment were made.
- One single VIP connection point per Member State.
- Requirement evolution is assessed very low.
- Internationalisation requirements are considered low because this is only exchange of the data without impact on internationalisation of user interfaces.
- Transaction loads are assumed very high.

With those parameters, development and maintenance costs for each Member State were estimated as follows:

		Workload - # person-hours	Workload - # person-months	Duration - calendar days
Development		311	1.9	15
Maintenance	Year 1	48	0.3	365
	Year 2	42	0.3	365
	Year 3	39	0.2	365
	Year 4	35	0.2	365
	Year 5	37	0.2	365
Total		**512**	**3.2**	

Table 8-78: VIP-EU: costs estimates for Member States

8.14.3.2 Costs for the central development and maintenance

Depending on the option, the costs for central development and maintenance vary.

Costs estimates using Cost Xpert were done on the following specific assumptions:

- Project type: Internet Web.
- Project lifecycle and project standard: RUP.
- Estimation method: UML Use case scenarios. 1 UC has been taken into account (UC10).
- No assumptions on the technical environment were made.
- One single VIP connection point per Member State.
- Requirement evolution is assessed very low.
- Internationalisation requirements are considered low because this is only exchange of the data without impact on internationalisation of user interfaces.
- Transaction loads are assumed very high.

For option A, the implementation costs for the EU related to the re-use of CIRCABC are considered as negligible.

The costs for central development are the same for options B1, B2 and B4 as only 1 system has to be taken into account. Because only 1 use-case is to be added to an existing system, including the implementation of one additional use-case in the project plan is the most cost effective approach. Taking this into account, it appears that the costs related to the implementation of that single use-case represent the same workload for options 1, 2 and 4 because a single system is concerned.
With that same approach, the costs for option 3 are doubled because 2 systems have been taken into account.
The costs for options B1 (VIP-MS re-using EUCARIS only), B2 (VIP-MS re-using ERRU only) and B4 (VIP-MS is a new system) are the following:

Option B 1, B2, B4		Workload - # person-hours	Workload - # person-months	Duration - calendar days
Development		312	2.0	14
Maintenance	Year 1	48	0.3	365
	Year 2	43	0.3	365
	Year 3	38	0.2	365

	Year 4	35	0.2	365
	Year 5	38	0.2	365
Total		**514**	**3.2**	

Table 8-79: VIP-EU: costs estimates for central development - option B1, B2 and B4

The costs for the central development of option B3 (VIS-MS re-using both ERRU and EUCARIS) are the following:

Option B 2 (VIP-MS ERRU only)		**Workload - # person-hours**	**Workload - # person-months**	**Duration - calendar days**
Development		624	3.9	28
Maintenance	Year 1	96	0.6	365
	Year 2	86	0.5	365
	Year 3	76	0.5	365
	Year 4	70	0.4	365
	Year 5	76	0.5	365
Total		**1,028**	**6.4**	

Table 8-80: VIP-EU: costs estimates for central development - option B3

The most cost effective from central implementation side is option A (re-use CIRCA).
The costs for extending VIP-MS depend on the option chosen for this part of the VIP. The costs for options B1, B2 and B4 are the same because only one system needs to be extended (EUCARIS, ERRU or new VIP-MS). Option 3 is the most expensive solution because both systems have to be taken into account.

8.15 VIP- Proof of Concept

The following section provides detailed information on the list of deliverables, tasks list and required staff needed for the implementation of the POC.

8.15.1 Deliverables foreseen for the POC

The deliverables that should be foreseen within the scope of the POC are a selected subset of RUP artifacts:

Software Development Plan – including Project Plan, Configuration Management Plan and Risk Management Plan.

Use-Case Model - Identifies and elaborates actors and use-cases.

Software Architecture Document - Describes the software architecture and its impact on the existing components.

User Interface Prototype - Prototype of the web interface for the VIP-VM sub-system.

Data Model - Model of the database structure.

Deployment Plan – Model of the deployed architecture.

Test Model - Shows test cases, procedures, scripts, and a workload model.

Release Notes - Release notes for a given build.

The software itself

8.15.2 Tasks to be performed

This section provides a list of tasks to be executed within scope of each phase of the POC implementation project.

Inception phase

- Verify the initial use-case model: verify the definition for the 3 use-cases concerned (UC03, UC07, UC10) based on the description provided in section 8.10.5 ‘Use cases’ of the current document, and include them in the existing use case model.

- Design data format– data model limited to the scope of the business content of messages to be exchanged (use also implementation guidelines included in section 6.3.1.1 and data entities description included in section 8.10.2 ‘Data entities’).

- Update functional and non-functional requirements – refer to the initial definition of requirements in sections 8.10.1 ‘General functional requirements’ and 8.10.6 ‘Non-functional requirements’

- Design the User Interface Prototype for VIP-VM – refer to section 5.2.1 ‘VIP VM – technical data flow’ for design principles.

- Create the Software Development Plan.

Elaboration phase

- Prepare the environments for the development, tests and acceptance of the POC.

- Update the existing Software Architecture Description document including existing communication interface specifications.

- Update existing data model and database design.

- Update existing test model.

- Ensure the maintenance of the existing project deliverables:

  - Requirements;

  - Use-case model;

  - Data format.

  - Software Development Plan.

Construction phase (main development, 3 iterations - one per each use case)

- Update the existing deployment plan.

- Coding and testing (2 or 3 releases per iteration).

- Ensure the maintenance of the existing project deliverables:

  - Requirements;

  - Use-case model;

  - Software architecture description;

  - Data model;

  - Environment;

  - Software Development Plan.

Transition phase (integration with MS and VM, 2-3 iterations)

- Coding and testing (1 release per iteration where final release is used for acceptance tests).

- Ensure the maintenance of the existing project deliverables:

  - Requirements;

  - Use-case model;

  - Software Architecture Description;

  - Data model;

  - Environment;

  - Software Development Plan.

8.15.3 List of required staff

The following RUP roles are identified and described[84]. It possible that one person has more than one role, for example the Designer and the Test Designer.

Analyst – "*The analyst role leads and coordinates requirements elicitation and use-case modeling by outlining the system's functionality and delimiting the system; for example, establishing what actors and use cases exist, and how they interact.*"

Designer - "*The designer role defines the responsibilities, operations, attributes, and relationships of one or several classes, and determines how they will be adjusted to the implementation environment. In addition, the designer role may have responsibility for one or more design packages, or design subsystems, including any classes owned by the packages or subsystems.*"

Test Designer - "*The Test Designer role is responsible for defining the test approach and ensuring it's successful implementation. The role involves identifying the appropriate techniques, tools and guidelines to implement the required tests, and to give guidance on the corresponding resources requirements for the test effort.*"

Software architect - "*The software architect role leads and coordinates technical activities and artifacts throughout the project.*"

Implementer - "*The implementer role is responsible for developing and testing components, in accordance with the project's adopted standards, for integration into larger subsystems.*"

Tester - "*The Tester role is responsible for the core activities of the test effort, which involves conducting the necessary tests and logging the outcomes of that testing.*"

Project Manager - "*The project manager role allocates resources, shapes priorities, coordinates interactions with customers and users, and generally keeps the project team focused on the right goal.*"

[84] Source of description is The Rational Unified Process®

8.16 Costs and benefits analysis of collecting information on odometer readings and vehicle accident history

Within the scope of the study, a cost and benefit analysis on collecting and storing available information concerning the main safety-related components of vehicles which have been involved in serious accidents as well as the possibility of making information on accident history and odometer readings available in an anonymised form to inspectors, holders of registration certificates and accident researchers. The current section presents the analysis and its results.

A distinction was made between:

- **odometer reading systems** – such systems exist already in some Member States (for example NAP/RDW in Netherlands and Car-Pass in Belgium) and are therefore easy to assess;
- and **accident history systems** – these systems exist for statistical purposes but are not yet implemented for vehicle traceability purposes.

8.16.1 Odometer reading systems

8.16.1.1 Costs

The costs of collecting and storing odometer data are low for the following reasons:

- These systems are based on the collection of three values only: the VIN, the date of observation and the odometer reading.
- In more than 90% of the cases, these data exist or are generated automatically from the Dealer Management System (DMS) of the service provider (PTI centre, garage, etc.). Such approach reduces errors and the burden related to data entry.
- For these reasons, the law imposes to the different sources to send their data to the central system "at no cost". The system provides DMS updates for generating the standard odometer reading messages and provides to stakeholders virtual mailboxes that make the whole process automatic in most cases (In Belgium, 90% of data are sent automatically and only 2% of data transfers are still done per fax or post).
- There are no personal data requesting specific security measures and no link with the owner (no plate number). In countries like Belgium where the license plate number is changed at each registration, this would not be useful. In countries like the Netherlands where the license plate stays attached to the vehicle, the license plate could be more easily used than the VIN but in any case the VIN seems the most appropriate unique key. It is considered as important to maintain the split between mileage data and personal data since linking to an individual person could be invasive or misused for commercial purposes, for example by insurance, leasing and automotive companies.
- The need for linking with other systems (e.g. from car manufacturers etc.) is reduced and optional (e.g. for facilitating error detection and operations). Two other systems provide information to Car-Pass:
  - Link with the government plate registration file which communicates all new registrations to the system, without link with the owner: the VIN will be later "recognised" as the VIN of a car validly registered in the relevant Member State. Unrecognised VIN could be typos and are checked.

- Link with the government body in charge of managing enterprises, in order to contact and inform all new "sources" (information provider) and to provide them their own virtual mailbox or their ID/Password.

8.16.1.2 Benefits

In countries where such systems were fully implemented, in the result there was observed dramatic reduction of frauds. For example, during the first year of operation of the system in Belgium, more than 60.000 tampered odometers were discovered, meaning fraud in 9% of the cases. In 2013 the number of discovered fraud was dramatically reduced (by 98%) to only 1.085, representing 0.15% of used cars sales.

The benefits of such a system must be assessed by comparing the cost of fraud with the cost of residual fraud (that even the best system would never be able to avoid) and the operational costs of the fraud detection system itself.

At the scale of EU, the combination of increased depreciation and increased maintenance and repair costs is estimated at about €6 billion (low estimation scenario) and €10 billion (high estimation scenario). In 2010, the figure for 25 Member States were assessed as follows (yearly costs)[85]:

On yearly basis	**Cost of Odometer fraud due to increased depreciation**		**Cost of residual fraud if the Car-Pass system is extended to EU 25**
	Low scenario	High scenario	
	€3.927.103.706	€6.548.872.692	€ 88.603.762
	Cost of Odometer fraud due to increased maintenance & repair cost / security issues		
	Low scenario	High scenario	
	€1.700.609.247	€3.046.400.730	€ 43.380.049
Total costs	€5.627.712.953	€9.595.273.422	€131.983.812

Total benefits	€5.495.729.141	€9.463.289.610

The above benefits for the EU, assessed in 2010 (25 Member States at that stage), are estimated at a level between 5.5 and 9.4 billion €. These are to be compared with the cost of implementing the odometer fraud detection system at EU level. The following calculation was done for 5 Member States (BE, NL, FR, DE, LU) based on the number of registered vehicles:

On yearly basis	**BE**	**NL**	**FR**	**DE**	**LU**
Cost of OFD system	2.845.478	3.718.003	11.007.367	15.671.662	151.241
Benefits low scenario	100.290.363	192.762.315	471.401.428	705.412.639	11.776.290

[85] The numbers were collected during our 2014 Car-Pass assessment (interview Mr Michel Peelman, director of Car-Pass) of and in the 2010 Car Pass impact study of mileage fraud with used cars and adaptability of the Car-Pass model in other EU countries http://www.car-pass.be/docs/CAR-PASS-study-final-report.pdf - pages 104 & 130

Benefits high scenario	171.915.536	384.381.416	1.042.268.943	1.337.644.273	15.038.205
Cost/benefit ratio low	0,028	0,019	0,023	0,022	0,013
Cost/benefit ratio high	0,017	0,010	0,011	0,012	0,010

The basis for the calculation basis of the above cost/benefit ratios is the depreciation of vehicles (which impact mainly the consumer protection). However, ensuring fair competition between the car dealers reporting "true odometer values" and others who don't, and reinforcing security by informing the user on the real odometer value (in order to allow this user to make maintenance and security part replacement in due time) are other important aspects to be considered.

8.16.1.3 Weaknesses

The main weakness of the currently implemented systems is that such systems are not present in other Member States and third countries: "cleaned" markets like Belgium and the Netherlands are still marginally impacted by fraud coming from their neighbouring countries (mainly France, Germany and Luxembourg): *"Even after the start of Car-Pass, small criminal car dealers became wealthy from tampering on exclusive imported used cars, by simply doing the tampering in another country and importing the car."*[86]
Therefore, despite strict legislation, bad car dealers keep finding ways to deceive consumers and to create security issues. During the Car-Pass consumer survey, all investigated countries (Belgium, Netherlands, France, Luxembourg) found (with 70% to 86% of positive advises) that it would be helpful that each country has a central national odometer registration system able to inform users and in interconnected with other countries. The poorest results were obtained in Germany (46% positive, 19% negative and the highest percentage of "I don't' know": 34%). The best results were obtained in Belgium, where the system was already operational (86% positive, 4% negative and the lowest percentage of "I don't' know": 11%).

8.16.2 Accident history systems

The initially identified benefits of the collection of vehicle accident history are the following:

- Better knowledge available to citizens on vehicle history and its state resulting in higher consumer protection.
- As additional PTI can be required after the serious accident, storing accident information can facilitate the enforcement of such additional PTI execution. As a result, road safety would be improved.
- Road safety would also be improved through additional testing on safety equipment and testing information being available.

The study analysis shows that the cost/benefit ratio for systems tracing the vehicle accident history or the safety-related components that have been involved in serious accidents is much more difficult to assess that the cost/benefits ratio of simple odometer fraud detection system, for the following reasons:

[86] Declaration from Sebastien Gathon, Soco, Belgium – quoted in the Car-Pass impact study, p. 88 - http://www.car-pass.be/docs/CAR-PASS-study-final-report.pdf

- Existing EU systems like CARE are anonymised and not linked to a specific vehicle.
- Inter-government systems as EUCARIS may provide a convenient (reusable) architecture, but are not currently managing the relevant data.
- No individual vehicle accident-history system has been implemented so far in Member States, making possible the same ex-post evaluation as for odometer fraud detection systems.
- The simple fact of a technical intervention (e.g. repairing some security related system) does not provide evidences related to the actual security of a car.
- Relevant professional organisations object that – at the contrary of odometer data, which are objective and easy to collect, "serious accident" data are subjective. They often depend on long police investigations: an accident will be serious if a pedestrian is injured (even when the involved vehicle is not seriously damaged and when no safety-related component is involved) and may not be reported at all in most cases where it is technically serious, as soon it makes no victims (for example when – possibly due to odometer fraud, the engine timing belt of a car was not replaced in time and causes engine explosion and risk of loss of vehicle control on a highway, but fortunately without causing victims in most cases).
- At the contrary to the odometer reading, which is simple, inexpensive and already part of current service practice, the intervention of experts able to assess the seriousness of a technical incident could be much more expensive if not included in the PTI process.
- If this process is included in the PTI process, the criteria identifying the cases to be reported in a system should be clearly fixed and limited: e.g. repair to the vehicle structure / framework, changing the height, wheelbase or track, replacing one or more air bags after an accident. However, those criteria don't provide clear evidence regarding a weaker or a better security. Replacing most other security systems (e.g. replacing disk brakes by new parts) may be due to high mileage, but does not mean that security is reduced, at the contrary. Therefore well-maintained cars could be depreciated when poorly maintained cars would not be.
- Due to the multiple possibilities of involving the "liability" of safety components (this is often established months of years after the accident by police investigation or justice) and the multiple ways for repairing a car, it is difficult for such a system to be exhaustive.
- For sure, every buyer would love to receive an "accident free" certificate, but in the reality, a car could be perfectly repaired by an official dealer who will declare the repair in the system (this is the case when the damage was fully covered by a serious insurance), or at the contrary it could be repaired at low cost, sometimes "self-repaired" or without any invoice and without being declared in the system (when repairing it is not covered by a full insurance): this would cause additional depreciation of cars correctly repaired and insured (and insurance companies would be in charge to compensate the owner for this additional depreciation resulting from the repair, therefore they are not at all in favour of such a system).
- A system reporting repairs could be an incentive for undeclared work.
- It should be noted that data collection limited to "serious accidents" eliminates from the statistical data all cases where very high improvement of road safety was achieved. The

accidents which were not identified as "serious accidents" or did not happen at all due to the presence of specific safety-related vehicle components are avoided.

As long such a system is limited to the registration of a limited number of objective facts, the cost of such recording should not be higher than the cost for the odometer registration and could result from the dealer management system, for example:

- The fact on the provision of the new airbag devices for vehicle nr. X (obligation of the airbag dealer);
- The fact on the "end of life" of vehicle nr. X has been declared and registered;
- The number of registrations of this vehicle with specific VIN by different owners (this is not directly related with security but can be an indicator of poor maintenance of the vehicle - nevertheless such information is objective and desired by consumers).

In all other cases where the appreciation of an event has a part of subjectivity or is depending on multiple stakeholders investigations (insurance companies, police, experts) it will be much more difficult to assess the cost/benefit ratio and to obtain endorsement/support from these automotive stakeholders.

8.17 Bibliography

Legal and Political documents

EUROPEAN COMMISSION (1993), Commission Regulation (EC) No 3198/93 of 22 November 1993 amending Regulation (EEC) No 3846/87 establishing an agricultural products nomenclature for export refunds, OJ No L 288/10 of 23.11.1993

EUROPEAN COMMISSION (2008), Commission regulation (EC) No 692/2008 of 18 July 2008 implementing and amending Regulation (EC) No 715/2007 of the European Parliament and of the Council on type-approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (5 and Euro 6) and on access to vehicle repair and maintenance information

EUROPEAN COMMISSION (2009), Commission Regulation (EC) No 385/2009 of 7 May 2009 replacing Annex IX to Directive 2007/46/EC of the European Parliament and of the Council establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles (Framework Directive), OJ L 118/13 of 13.5.2009

EUROPEAN COMMISSION (2009), Commission Decision of 17 December 2009 on minimum requirements for the data to be entered in the national electronic register of road transport undertakings (notified under document C(2009) 9959), OJ L 339/36 of 22.12.2009

EUROPEAN COMMISSION (2009), Commission Regulation (EU) No 1266/2009 of 16 December 2009 adapting for the tenth time to technical progress Council Regulation (EEC) No 3821/85 on recording equipment in road transport, OJ L 339/3 of 22.12.2009

EUROPEAN COMMISSION (2010), Commission Directive 2010/47/EU of 5 July 2010 adapting to technical progress Directive 2000/30/EC of the European Parliament and of the

Council on the technical roadside inspection of the roadworthiness of commercial vehicles circulating in the Community, OJ L 173/33 of 8.7.2010

EUROPEAN COMMISSION (2010), Commission Directive 2010/48/EU of 5 July 2010 adapting to technical progress Directive 2009/40/EC of the European Parliament and of the Council on roadworthiness tests for motor vehicles and their trailer, OJ L 173/47 of 8.7.2010

EUROPEAN COMMISSION (2010), Commission recommendation of 5 July 2010 on the assessment of defects during roadworthiness testing in accordance with Directive 2009/40/EC of the European Parliament and of the Council on roadworthiness tests for motor vehicles and their trailers (2010/378/EU), OJ L 173/74 of 8.7.2010

EUROPEAN COMMISSION (2010), Commission Regulation (EU) No 1213/2010 of 16 December 2010 establishing common rules concerning the interconnection of national electronic registers on road transport undertakings, OJ L 335/21 of 18.12.2010

EUROPEAN COMMISSION (2011), White Paper Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system {SEC(2011) 359 final; SEC(2011) 358 final; SEC(2011) 391 final}, COM(2011) 144 final of Brussels, 28.3.2011

EUROPEAN COMMISSION (2011), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Towards a European road safety area: policy orientations on road safety 2011-2020, COM(2010) 389 final

EUROPEAN COMMISSION (2012), Proposal for a Regulation of the European Parliament and of the Council on the protection of individuals with regard to the processing of personal data and on the free movement of such data (General Data Protection Regulation), Brussels, 25.1.2012, COM(2012) 11 final, 2012/0011 (COD)

EUROPEAN COMMISSION (2012), Staff Working Paper Impact Assessment accompanying document to the Regulation of the European Parliament and of the Council on Periodic Roadworthiness Tests for Motor Vehicles and their Trailers and repealing Directive 2009/40/EC and Regulation of the European Parliament and of the Council on the Technical Roadside Inspections of the Roadworthiness of Commercial Vehicles Circulating in the Union and repealing Directive 2000/30/EC and Directive of the European Parliament and of the Council amending Council Directive 1 999/37/EC on the Registration Documents for Vehicles {COM(2012) 380 final} {SWD(2012) 207 final}, of Brussels, 13.7.2012 {SWD(2012) 206 final}

EUROPEAN COMMISSION (2013), Commission Directive 2013/60/EU of 27 November 2013 amending for the purposes of adapting to technical progress, Directive 97/24/EC of the European Parliament and of the Council on certain components and characteristics of two or three-wheel motor vehicles, Directive 2002/24/EC of the European Parliament and of the Council relating to the type-approval of two or three-wheel motor vehicles and Directive 2009/67/EC of the European Parliament and of the Council on the installation of lighting and light-signalling devices on two- or three-wheel motor vehicles

EUROPEAN COMMISSION (2014), Commission Delegated Regulation (EU) No 3/2014 of 24 October 2013 supplementing Regulation (EU) No 168/2013 of the European Parliament and of the Council with regard to vehicle functional safety requirements for the approval of two- or three-wheel vehicles and quadricycles

EUROPEAN COMMISSION (2014), Commission Delegated Regulation (EU) No 44/2014 of 21 November 2013 supplementing Regulation (EU) No 168/2013 of the European Parliament and of the Council with regard to the vehicle construction and general requirements for the approval of two- or three-wheel vehicles and quadricycles

EUROPEAN COMMISSION (2014), Commission Delegated Regulation (EU) No 134/2014 of 16 December 2013 supplementing Regulation (EU) No 168/2013 of the European Parliament and of the Council with regard to environmental and propulsion unit performance requirements and amending Annex V thereof

EUROPEAN COMMISSION (2014), Commission Directive 2014/44/EU of 18 March 2014 amending Annexes I, II and III to Directive 2003/37/EC of the European Parliament and of the Council on type-approval of agricultural or forestry tractors, their trailers and interchangeable towed machinery, together with their systems, components and separate technical units

EUROPEAN COMMISSION (2014), Commission Directive 2014/43/EU of 18 March 2014 amending Annexes I, II and III to Directive 2000/25/EC of the European Parliament and of the Council on action to be taken against the emission of gaseous and particulate pollutants by engines intended to power agricultural or forestry tractors

COUNCIL DIRECTIVE 96/96/EC of 20 December 1996 on the approximation of the laws of the Member States relating to roadworthiness tests for motor vehicles and their trailers

COUNCIL OF THE EUROPEAN UNION (1977), Council Directive 77/143/EEC of 29 December 1976 on the approximation of the laws of the Member States relating to roadworthiness tests for motor vehicles and their trailers, OJ L 47 of 18.02.1977

COUNCIL OF THE EUROPEAN UNION (1992), Council Regulation (EEC) No 684/92 of 16 March 1992 on common rules for the international carriage of passengers by coach and bus, OJ L 74 of 20.3.1992

COUNCIL OF THE EUROPEAN UNION (1992), Council Regulation (EEC) No 881/92 of 26 March 1992 on access to the market in the carriage of goods by road within the Community to or from the territory of a Member State or passing across the territory of one or more Member States, OJ L 95 of 9.4.1992

COUNCIL OF THE EUROPEAN UNION (1993), Council Decision of 30 November 1993 on the creation of a Community database on road accidents (93/704/EC), OJ No L 329/63 0f 30.12.1993

COUNCIL OF THE EUROPEAN UNION (1996), Council Directive 96/26/EC of 29 April 1996 on admission to the occupation of road haulage operator and road passenger transport operator and mutual recognition of diplomas, certificates and other evidence of formal qualifications intended to facilitate for these operators the right to freedom of establishment in national and international transport operations, OJ L 124 of 23.5.1996

COUNCIL OF THE EUROPEAN UNION (1997), Council Directive 96/96/EC of 20 December 1996 on the approximation of the laws of the Member States relating to roadworthiness tests for motor vehicles and their trailers, OJ L 46 of 17.2.1997

COUNCIL OF THE EUROPEAN UNION (1998), Council Regulation (EC) No 12/98 of 11 December 1997 laying down the conditions under which non-resident carriers may operate national road passenger transport services within a Member State, OJ L 4/10 of 8.1.1998

COUNCIL OF THE EUROPEAN UNION (1999), Council Directive 1999/37/EC of 29 of April 1999 on the registration document for vehicles, OJ L138/57 of 1.6.1999

COUNCIL OF THE EUROPEAN UNION (2005), Prüm Convention, Brussels 7.07.2005, 10900/05

COUNCIL OF THE EUROPEAN UNION- Council Decision 2008/615/JHA of 23 June 2008 on the stepping up of cross border cooperation, particularly in combating terrorism and cross border crime, Council Decision 2008/616/JHA of 23 June 2008 on the implementation of Council Decision 2008/615/JHA of 23 June 2008 on the stepping up of cross-border cooperation, particularly in combating terrorism and cross-border-crime ("Prüm Decisions") - statistics and reports on automated data exchange for 2013

THE COUNCIL OF THE EUROPEAN COMMUNITIES (1985), Council Regulation (EEC) No 3821/85 of 20 December 1985 on recording equipment in road transport, OJ L 370 of 31.12.1985

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (1995), Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, OJ L 281/31 of 23.11.1995

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2000), Directive 2000/30/EC of the European Parliament and of the Council of 6 June 2000 on the technical roadside inspection of the roadworthiness of commercial vehicles circulating in the Community, OJ L 203/1 of 10.8.2000

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2000), Directive 2000/53/EC of the European Parliament and of the Council of 18 September 2000 on end-of life vehicles, OJ L 269, of 21.10.2000

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2001), Regulation No 45/2001 of the European Parliament and of the Council of 18 December 2000 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data, OJ L8/1 of 12.01.2001

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2002), Directive 2002/24/EC of the European Parliament and of the Council of 18 March 2002 relating to the type-approval of two or three-wheel motor vehicles and repealing Council Directive 92/61/EEC, OJ L 124/1 of 6.5.2002

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2003), Directive 2003/37/EC of the European Parliament and of the Council of 26 May 2003 on type-approval of agricultural or forestry tractors, their trailers and interchangeable towed machinery, together with their systems, components and separate technical units and repealing Directive 74/150/EEC, OJ L 171/1 of 9.7.2003

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2006), Regulation (EC) No 561/2006 of the European Parliament and of the Council of 15 March 2006 on the harmonisation of certain social legislation relating to road transport and amending Council Regulations (EEC) No 3821/85 and (EC) No 2135/98 and repealing Council Regulation (EEC) No 3820/85, OJ L 102/1 of 11.4.2006

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2006), Directive 2006/24/EC of the European Parliament and of the Council of 15 March 2006 on the retention of data generated or processed in connection with the provision of publicly available electronic communications services or of public communications networks and amending Directive 2002/58/E, OJ L 105/54 of 13.04.2006

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2006), Directive 2006/126/EC of the European Parliament and of the Council of 20 December 2006 on driving licences, OJ L 403 of 30.12.2006

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2007), Regulation (EC) No 715/2007 of the European Parliament and of the Council of 20 June 2007 on type approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information, OJ L 171/1 of 29.06.2007

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2009), Directive 2007/46/EC of the European Parliament and of the Council of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles, OJ L 263/1 of 9.10.2007

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2009), Regulation (EC) No 595/2009 of the European Parliament and of the Council of 18 June 2009 on type-approval of motor vehicles and engines with respect to emissions from heavy duty vehicles (Euro VI) and on access to vehicle repair and maintenance information and amending Regulation (EC) No 715/2007 and Directive 2007/46/EC and repealing Directives 80/1269/EEC, 2005/55/EC and 2005/78/E, OJ L 188/1 of 18.07.2009

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2009), Directive 2009/40/EC of the European Parliament and of the Council of 6 May 2009 on roadworthiness tests for motor vehicles and their trailers, OJ L 141/12 of 6.6.2009

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2009), Regulation (EC) no 661/2009 of the European Parliament and of the Council of 13 July 2009 concerning type-approval requirements for the general safety of motor vehicles, their trailers and systems, components and separate technical units intended therefore

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2009), Regulation (EC) No 1071/2009 of the European Parliament and of the Council of 21 October 2009 establishing common rules concerning the conditions to be complied with to pursue the occupation of road transport operator and repealing Council Directive 96/26/EC, OJ L 300/51 of 14.11.2009

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2009), Regulation (EC) No 1072/2009 of the European Parliament and of the Council of 21 October 2009 on common rules for access to the international road haulage market, OJ L 300/72 of 14.11.2009

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2009), Regulation (EC) No 1073/2009 of the European Parliament and of the Council of 21 October 2009 on common rules for access to the international market for coach and bus services, and amending Regulation (EC) No 561/2006, OJ L 300/88 of 14.11.2009

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2013), Regulation (EU) No 168/2013 of the European Parliament and of the Council of 15 January 2013 on the approval and market surveillance of two- or three-wheel vehicles and quadricycles.

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2014), Directive 2011/82/EU of the European Parliament and of the Council of 25 October 2011 facilitating the cross-border exchange of information on road safety related traffic offences, OJ L 288/1 of 5.11.2011

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2014), Regulation (EU) No 165/2014 of the European Parliament and of the Council of 4 February 2014 on tachographs in road transport, repealing Council Regulation (EEC) No 3821/85 on recording equipment in road transport and amending Regulation (EC) No 561/2006 of the European Parliament and of the Council on the harmonisation of certain social legislation relating to road transport, OJ L 60/1 of 28.02.2014

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2006), Directive 2014/47/EU of the European Parliament and of the Council of 3 April 2014 on the technical roadside inspection of the roadworthiness of commercial vehicles circulating in the Union and repealing Directive 2000/30/EC, OJ L 127/134 of 29.4.2014

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2014), Directive 2014/45/EU of the European Parliament and of the Council of 3 April 2014 on periodic roadworthiness tests for motor vehicles and their trailers and repealing Directive 2009/40/EC, L 127/51 of 29.04.2014

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION (2014), Directive 2014/46/EU of the European Parliament and of the Council of 3 April 2014 amending Council Directive 1999/37/EC on the registration documents for vehicles, L 127/129 of 29.04.2014

CONVENTION FOR THE PROTECTION OF HUMAN RIGHTS AND FUNDAMENTAL FREEDOMS as amended by Protocols No. 11 and No. 14, Rome, 4.XI.1950

TREATY ESTABLISHING THE EUROPEAN COMMUNITY (2002), consolidated version, C 325/35 of 24.12.2002

TREATY OF LISBON amending the Treaty on European Union and the Treaty establishing the European Community, signed at Lisbon, 13 December 2007, (OJ C 306 of 17.12.2007)

EUROPEAN UNION (EU) (2002), Data Protection Directive of 1995 Frequently Asked Questions, of May 2002

Directorate-General for Mobility and Transport, Care Database – CADaS - Common Accident Data Set, version 3.2 of 22/02/2013

Literature

IDELSY (2006), Initiative for Diagnosis of Electronic Systems in Motor Vehicles for PTI, Project Details, 01.1.2004 until 1.12.2005

IDELSY (2005), Initiative for Diagnosis of Electronic Systems in Motor Vehicles for PTI, 31.12.2005

IDELSY (2006), Initiative for Diagnosis of Electronic Systems in Motor Vehicles for PTI, Management Summary, 19.04.2006

UNISYS NEDERLAND N.V. (2007), Software Architecture Document RDW EUCARIS II, version v 4.1 of 14.12.2007

EUCARIS OVERVIEW RDW (2008), version v 1.10 of 26.05.2008

CAR-PASS (2010), Impact study of mileage fraud with used cars & adaptability of the Car-Pass model in other EU countries, October 2010

EUROPEAN COMMISSION (2012), Memo, Road Safety: The Roadworthiness Package – Tougher vehicle checks to save lives, of Brussels 13.07.2012

COUNCIL OF THE EUROPEAN UNION (2011), Directive on cross-border exchange of information on road safety offences adopted, Brussels, 29 September 2011, 14413/11, PRESSE 316

COUNCIL OF THE EUROPEAN UNION PRESS RELEASE (2014), Council adopts the roadworthiness package, 7979/14 (OR. en), PRESSE 169, of Brussels 24.03.2014

E-REG (2011), The Vehicle chain in Europe 2011, a survey of Vehicle and Driving Licence Procedures Part one, of May 2011

E-REG (2014), EReg Topic Group XIII - Vehicle Mileage Registration Final Report April, version Draft 0.7, April 2014

AUTOFORE (2007), Study on the Future Options for Roadworthiness Enforcement in the European Union

EUROPEAN COMMISSION AND SIEMENS (2011), European Commission Directorate General For Mobility & Transport European (Register for Road Transport - Undertakings) and Siemens, Network and Security Reference Guide, version v 1.10 of 23.08.2011

EUROPEAN COMMISSION AND SIEMENS (2011), European Commission Directorate General For Mobility & Transport European (Register for Road Transport - Undertakings) and Siemens, Global Business Analysis, version v 2.0 of 23.09.2011

EUROPEAN COMMISSION AND ATOS (2012), European Commission Directorate General for Mobility & Transport (European Register for Road Transport – Undertakings) and Atos, XML Messaging Reference Guide, version v3.00 of 14.03.2012

UNISYS NEDERLAND N.V. (2008), Local Admin Guide RDW EUCARIS II, version v 5.0 of 08.12.2008

EUCARIS (2000) Rules of Procedure, October 2000

EUCARIS (2013) Statistical Report 1-1-2013 / 30-06-2013 Source RDW

GARTNER (2008): A Report for Directorate General Transport and Energy: Eucaris Resper Evaluation Study

EUROPEAN COMMISSION (2012): MOVEHUB Guidelines for the Member States' Tests - section 2 2 MOVEHUB Guidelines for the Tests V1 20.pdf

Anfac (2012): EUROPEAN MOTOR VEHICLE PARC 2010

Links

https://www.eucaris.net/

http://www.car-pass.be/

https://www.ereg-association.eu/

https://www.oasis-open.org/

http://www.oeko.de/

http://www.acea.be/

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