EUROPEAN UNION AGENCY FOR RAILWAYS

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ACCOMPANYING REPORT N. ERA-REC-102-2016/ACR TO THE RECOMMENDATION OF THE EUROPEAN UNION AGENCY FOR RAILWAYS

on

Rationalisation of Vehicle-related Registers (RVRR)

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0. Executive summary

Note *This report has been prepared by the Interoperability Unit of the Agency. It has been discussed with the RVRR WP. Formal comments received from the WP members will be included in an Annex.*

Legal base The task for the rationalisation of the registers related to vehicles is carried out by the Agency in accordance with [L1] Regulation (EC) 881/2004 (Agency Regulation), Articles 18 and 19, and §9.4 of [D1] Agency Work Program 2013, §6.7 of [D2] Work Program 2014, §4.2., 4.29 of [D3] Agency Programming Document 2016.

Scope of the task The rationalisation task is limited to the vehicle-related registers: NVR (and VVR), ERATV, VKMR, register of ECM Certificates (ECMCR). Interfaces with other registers or databases mandated by the EU legislation (e.g. the register of infrastructure RINF or the rolling stock reference databases RSRDs defined in TAF TSI) are considered as far as data regulated by EU legislation is concerned.

Objective of the task The objective of the RVRR project is to achieve the definition of the amendments to the specification of the vehicle-related registers that contribute to the rationalisation of the registers, consolidating them in a single system, by giving consideration to the problems reported by stakeholders. The output of the RVRR project is an Agency Recommendation on the amendment of the specifications of the vehicle-related registers.

Project phases The project has been split into three phases:

- *Inception phase* (September 2013 - December 2013) - focused on the elaboration of the project methodology, including the one for impact assessment.
- *Intermediate phase* (January 2014 - December 2014) - concentrated on the analysis of the AS-IS situation and the identification and assessment of the alternative rationalisation scenarios.

Three possible rationalisation scenarios – **Do Minimum, Do Medium and Do Maximum** - were presented to EC (DG MOVE) and to RISC in February 2015. During a subsequent Workshop in April 2015, Member States endorsed the Do Medium scenario. An updated project time-plan for the final phase of the project based on the Do Medium scenario was presented to RISC in June 2015.

- *Final phase* (June 2015 - December 2016) - focused on the detailed analysis of the actions included in the Do Medium scenario, on the definition of the corresponding amendments to the specifications of the vehicle-related registers and on the completion of the impact assessment.

Stakeholder expectations

Stakeholders stressed the importance to move into the direction of a more efficient system of registers and without duplication of data.

Furthermore, correctness and trustworthiness of data are considered fundamental requirements as well as the need to have registers closer to the real business uses of the data in a cost-efficient manner.

Purpose of the vehicle-related registers

The RVRR WP believes that the registers have a traceability purpose and therefore their primary use is administrative; nevertheless, the registers should be capable to be source of master reference data for external systems.

Also, the RVRR WP is of the opinion that the registers, as of today, cannot serve operational uses.

AS-IS analysis

Although the analysis of the current situation largely reused the findings from the [D7] Study on Coherence and Consistency of Registers, several additional inputs were collected. The analysis identified issues mainly related to:

- Insufficient availability (ECVVR);
- Specifications and responsibilities for data input not sufficiently clear;
- Insufficient quality of data due to lack of format conventions, missing validation deadlines, obsolete procedures for data collection/exchange (e.g. paper-based), minimal use of reference data, redundant data, etc.
- Limited usability due to multiple not interfaced IT tools, lack of a common “look and feel”/single sign on/multilingual interface, disaggregated complementary data, etc.

- Absent or unclear provisions regarding notifications on changes;
- Insufficient support to day to day business needs and to the generation of reports.

Within the AS-IS analysis, a model of vehicle-related data was drafted. Additionally a list of business use cases was collected.

Proposed rationalisation

The rationalisation, based on the selected Do Medium scenario, includes a set of rationalisation actions that aim at:

- improving data quality (completeness, accuracy, consistency, timeliness);
- clarifying where needed the registers' specifications in order to separate responsibilities or streamline the processes;
- facilitating the access to information;
- improving the usability of the registers and the overall user experience;
- improving the support of registers to the business use cases.

Assessment of the rationalisation scenarios

Several rounds of analysis have been run together with the stakeholders represented in the RVRR WP in order to build the three alternative rationalisation scenarios/options (in the terminology of the impact assessment, the word "option" is used with an identical meaning to "scenario"): Do Minimum, Do Medium, Do Maximum. The grouping was based on the combined assessment of the importance and urgency of various rationalisation actions.

Since Do Maximum included among its actions the setting up the European Vehicle Register, which needs to be substantiated by a dedicated cost-benefit analysis, as also required by the 4th Railway Package, it was commonly endorsed, during the workshop organized by the Agency on April 22nd 2015 and further on, at the RISC meeting on June 4th 2015, that Do Maximum should not be retained for further analysis in the framework of the RVRR project.

Based on this rationale, the further assessment focused on Do Minimum and Do Maximum, which underwent both a qualitative and a quantitative analysis.

In the **qualitative analysis** the two scenarios/options have been scored (on a scale from 1 to 5) in terms of their contribution to achieving the objectives of: improving the data in the registers; better interfacing the registers' IT tools; improving processes for data collection and exchange; clarifying and supporting access to data. Do Medium got a higher score (average 4.5) compared to Do Minimum (average of 2) - see details in Annex 5: Impact assessment.

In the **quantitative analysis**, which was fed and refined based on the input from the members of the RVRR WP, estimates have been provided for the initial costs, the recurring costs and the expected benefits, per category of stakeholders. The benefit/cost ratio for a 20 year forecast, based on present values is higher than 1 for both rationalization scenarios (see Annex 5: Impact assessment).

By combining the outcomes of the qualitative and quantitative analysis, **Do Medium** was proposed as a preferred scenario/option. The analysis of the expected costs and benefits was refined for each of the rationalisation actions included in this scenario.

Conclusions

The rationalisation of the vehicle-related registers described in this report requires the amendment of the NVR specification, in line with the rationalisation actions proposed in the Do Medium scenario. However, some actions of strictly technical nature have no impact on the NVR specification and may be implemented independently from the adoption of the amended NVR specification. The rationalisation has very limited impact on the ERATV specification; therefore no immediate amendment is proposed; these requirement will be incorporated in the next revision cycle of the ERATV specification.

It is estimated that the timeframe for the implementation of the rationalisation is of maximum four years from the publication of the amended NVR specification in the Official Journal of the European Union.

1. Overview of the task

1.1. Background

In February 2012, following a contract with the European Commission, consultants delivered a report for the [D6] EU Rail Vehicle & Infrastructure Databases Study whose objectives were to collect the data requirements that arise from the European Railway Regulatory framework, the market needs for real time data exchange and the existing IT applications in operation or under development in Europe, in order to recommend a real-time data exchange system from the technical, governance and financial aspects. The study provided a set of recommendations for the overall IT system solution and its phased implementation.

In parallel to this study, the European Commission requested the Agency to report about the consistency and the coherence between the legally required registers on the one hand and the need of registers and data exchange among actors in the railway sector following their business models, on the other hand, also including the need of the railway actors regarding the mandatory registers that may exist in third countries (e.g. OTIF, “1520 area”).

The final report of the [D7] Study on Coherence and Consistency of Registers that was published by the Agency in January 2013 analysed the relations among the registers and described the deficiencies and the areas of improvements based on stakeholders’ feedback. In addition, the report analysed the extent to which the registers answer the business needs of the sector and traced rationalisation scenarios that might be considered for each register or group of registers.

The following Workshop on Registers held in Lille on 12 March 2013 concluded that the area where stakeholders consider more important to intervene with rationalisation actions is the group of registers related to vehicles.

Consequently, the Agency presented to RISC 67 in June 2013 a roadmap for the rationalisation of vehicle-related registers. The RVRR project is in line with the steps outlined in the roadmap and further detailed in the Terms of Reference (Annex 4: Terms of reference).

1.2. Scope of the analysis

The scope of the analysis are the vehicle-related registers - NVR, ERATV, VKMR, ECMCR - as they are defined in the European Railway Regulatory framework.

Interfaces with other registers or databases mandated by the current EU legislation (e.g. the register of infrastructure RINF or the rolling stock reference databases RSRDs provided for by the [L9] TAF TSI) are considered as far as data regulated by EU legislation is concerned.

Vehicle-related data and data exchanges (among railway business actors) that are not regulated by the EU legislation are not in the scope of the RVRR project.

The evolution of the EU legislation (e.g. 4th Railway Package) and the possible impact on the OTIF registers which are equivalent to the above EU registers[1], are also taken into account.

The proposals for amendments of the registers' specifications relate only to the rationalisation of the vehicle-related registers and aim at answering the problems reported by the stakeholders (e.g. recorded in the [D7] Study on Coherence and Consistency of Registers) before the start of the project or by the members of the working party during the execution of the project.

Format of recorded data and exchange formats are in the scope of the project as far as they concern the rationalisation.

The nature of the data recorded in the registers is out of the scope of the project, except the cases where further investigation is mandated by the EU legislation (e.g. [L5] ERATV Decision requested to analyse the possible inclusion in ERATV of types of vehicles authorised for placing into service before the entry into force of the Interoperability Directive.

1.3. Legal base

The task for the rationalisation of the registers related to vehicles is carried out by the Agency in accordance with [L1] Regulation (EC) 881/2004 (Agency Regulation), Articles 18 and 19, the Agency [D1] Work Program 2013, §9.4 "Registers for interoperability" and [D2] Work Program 2014, §6.7 "Architecture and use of registers".

The registers objects of the task are kept by the Agency according to the relevant legislative provisions:

[1] In particular, the VKMR is "managed by ERA and OTIF in cooperation (ERA for the EU and OTIF for all non-EU OTIF Member States)" (§2.1 of NVR Decision, p.9) and the OTIF NVR specifications 2015 have been prepared on the basis of NVR Decision. Other vehicle related registers on which the EU, the Agency and OTIF have to cooperate under the [D6] "Administrative Arrangements between OTIF, ERA and DG-Move") are: the ECMCR, the Virtual Vehicle Register (VVR) and ERATV.

Register	Legal base
National Vehicle Register (NVR)	[L2] Directive 2008/57/EC (Interoperability Directive), Article 33; [L1] (EC) Regulation 881/2004 (Agency Regulation), Article 18 and 19; [L4] Commission Decision 2007/756/EC.
European Register of Authorised Types of Vehicles (ERATV)	[L2] Directive 2008/57/EC (Interoperability Directive), Article 34; [L1] (EC) Regulation 881/2004 (Agency Regulation), Article 18 and 19; [L5] Commission Decision 2011/665/EU.
Register of ECM Certificates (ECMCR)	[L6] Commission Regulation (EU) No 445/2011 (ECM Regulation), Article 10.4.
Register of Vehicle Keeper Markings (VKMR)	[L1] (EC) Regulation 881/2004 (Agency Regulation), Article 19; [L7] OPE TSI, Appendix P; chapter 2.1 and Appendix 6 (from 1 January 2014) of [L4] Commission Decision 2007/756/EC.

1.4. Problem to be addressed

The [D7] Study on Coherence and Consistency of Registers in its Annex provides for a comprehensive inventory of deficiencies reported by stakeholders concerning registers defined by European Railway Regulatory framework. The list includes:

- Unclear purpose/use of registers or certain categories of data stored therein.
- Data not updated (enough frequently) or not reliable.
- Duplication of certain categories of data across several registers.
- Excessive setup and maintenance cost of registers and data feeding.
- Complex architecture of some registers.
- Unclear identification of the data ownership or definition of the data updates cycle.
- Focus on the legal requirements and insufficient consideration of real business needs/uses.
- Certain data elements are deemed missing (for example, in NVR, the information on the Registration Holder as defined in Article 33(3) of [L2] Directive 2008/57/EC (Interoperability Directive)).

- Complementary information spread among several registers insufficiently linked among each other.
- Limited specification of registers required performances.

The Study analysed each reported problem providing either a clarification or a list of possible rationalisation actions. Additionally the Study [D7] contributed to the understanding of the problems by clarifying the characteristics of the registers, the stakeholders and their involvement in feeding and/or use of data.

Summarizing the main findings of the Study, the need that has been stated is to improve efficiency and effectiveness, remove duplication of data, simplify the data input and consultation, based on the expected (and approved) uses of the registers.

A complementary investigation of the problems to be addressed has been performed in the intermediate phase of the RVRR project in view of weighting each recognized deficiency/area of improvement based on its relevance from the perspective of the expected (and approved) uses of the registers, and discriminating needs from nice-to-have functionalities.

1.5. Project purpose

The purpose of the RVRR project is to achieve the definition of the amendments to the specifications of registers related to vehicles - NVR, ERATV, VKMR, ECMCR - that contribute to the rationalisation of the registers, consolidating them in a single system and giving consideration to the problems reported by the stakeholders.

The rationalisation shall improve efficiency and effectiveness, remove duplication of data, and simplify the data input and consultation, based on the expected (and approved) uses of the registers.

1.6. Project output

The output of the RVRR project is an Agency Recommendation on the amendment of the specifications of registers related to vehicles (NVR, ERATV, VKMR, ECMCR).

1.7. Project phases, milestones and deliverables

The project has been split into three phases:

- **Inception phase: from September 2013 to December 2013**

The inception phase focused on the elaboration of the project methodology, including the one for economic evaluation.

Outcome: Consensus among stakeholders as regards the project methodology and the economic evaluation methodology.

Output: Inception report.

- **Intermediate phase: from January 2014 to December 2014**

In the intermediate phase, works concentrated on the analysis of the AS-IS situation, including the modelling of the vehicle-related data that is regulated by EU legislation, and the identification and assessment of the alternative rationalisation scenarios.

Three incremental scenario of rationalisation of the vehicle-related registers were identified; each scenario comprising a set of rationalisation actions.

Do Minimum	Highly important, critical and urgent actions.
Do Medium	Actions of medium importance and urgency in addition to the actions of Do Do Minimum.
Do Maximum	Nice to have features which are however not critically important/urgent. The actions from Do Minimum and Do Medium are also considered within this scenario.

Outcome: Identification and assessment of the alternative rationalisation scenarios.

Output: Intermediate report and impact assessment for the alternative rationalisation scenarios.

- **Final phase: from January 2015 to December 2016**

At the end of intermediate phase, the alternative rationalisation scenarios were presented to EC (DG MOVE) and to RISC in February 2015.

During a subsequent Workshop in April 2015, Member States endorsed the Do Medium rationalisation scenario. An updated project time-plan for the final phase of the project based on the Do Medium scenario was presented to RISC in June 2015.

Therefore, during the final phase, works concentrated on the detailed analysis of the actions included in the Do Medium scenario, on the definition of the corresponding amendments to the specifications of the vehicle-related registers and on the refinement of the impact assessment.

Outcome: Definition of the registers' specifications for the chosen rationalisation scenario.

Output: Agency Recommendation, amendments to registers' specifications, final report and final impact assessment for the chosen rationalisation scenarios.

The table below summarizes the project milestones and deliverables.

Table 1: Milestones and deliverables

Milestone	Description	Deliverable	Outcome
1 September 2013	Kick-off date		
31 December 2013	End of inception phase	Inception report	Project methodology, including the one for economic evaluation
30 December 2014	End of intermediate phase	Intermediate report and impact assessment of the different rationalisation scenarios	Definition and assessment of the alternative rationalisation scenarios
10 February 2015 (RISC 72)	Presentation of intermediate report to RISC 72		
22 April 2015	Workshop with Member States.		Endorsement of Do Medium rationalisation scenario
4 June 2015	Presentation to RISC 73 of updated project time plan		Endorsement of the updated time-plan for the rationalisation solution Do Medium
October 2016	Presentation of draft final report to RISC		

Milestone	Description	Deliverable	Outcome
December 2016	End of final phase	Agency Recommendation on the amendment of the specifications of registers related to vehicles; accompanying final report and impact assessment report	Definition of the amendments to the specifications of the vehicle-related registers and impact assessment for the selected rationalisation solution.

2. Working structure and methodology

2.1. Workgroups

For drawing up the Recommendation, the Agency has established a Working Party for the Rationalisation of Vehicle-Related Registers in accordance with Article 3 of [L1] Regulation (EC) 881/2004 (Agency Regulation).

The following Representative Bodies participate in the working party: ALE, CER, EIM, EPTTOLA, ERFA, UIP, UIRR, UITP and UNIFE.

NSAs of several MSs have also appointed their representatives for the working party: Belgium, Denmark, Finland, France, Germany, Italy, Luxembourg, Romania, Portugal, Slovenia, Spain, Sweden and the United Kingdom.

Considering the accession of the European Union to the COTIF in 2011 and in order to cooperate on the vehicle-related registers which are equivalent in OTIF law and EU law, OTIF representative participates in the working party as observer (Article 5 and 8 of the [D8] “Administrative Arrangements between OTIF, Agency and DG-Move”).

The table below indicates all the WP meetings that were held during the RVRR project.

Table 2: Calendar of meetings

Meeting	Duration	Date
WP kick-off meeting	1 day	25/09/13

Meeting	Duration	Date
WP 2nd meeting	1 day	19/11/13
WP 3rd meeting	1 day	11/02/14
WP 4th meeting	1 day	15/04/14
WP 5th meeting	1 day	24/06/14
WP 6th meeting	1 day	16/09/14
WP 7th meeting	1 day	23/10/14
WP 8th meeting (economic evaluation workshop 1)	1 day	6/11/14
WP 8th meeting (economic evaluation workshop 2)	1 day	12/11/14
WP 9th meeting	1 day	25/11/14
WP 10th meeting	1 day	24/03/15
WP 11th meeting	1 day	19/05/15
WP 12th meeting	1 day	23/06/15
WP 13th meeting	1 day	18/09/15
WP 14th meeting	1 day	27/10/15
WP 15th meeting	1 day	26/11/15
WP 16th meeting	1 day	26/01/16
WP 17th meeting	1 day	19/04/16
WP 18th meeting	1 day	21/06/16
WP 19th meeting	1 day	07/09/16
WP 20th meeting	1 day	18/10/16
WP 21th meeting	1 day	22/11/16

2.2. Methodology

This paragraph describes the main steps taken by the WP to achieve the expected final output:

1. Analyse the current status of the system of vehicle-related registers (AS-IS analysis)

The AS-IS analysis (see chapter 5) describes the current status of vehicle-related registers and their interfaces. The deficiencies/areas of improvements reported by stakeholders were analysed and linked to their impact on the capacity of the register to serve stakeholders' business uses, distinguishing between real needs and "nice-to-have" features.

A model of vehicle-related data was drafted to describe, by means of a standard UML notation, the data objects kept in the vehicle-related registers, the actors involved in the submission or registration of data, the related processes and business use cases.

The responsibilities for the data input and for the data quality were investigated.

2. Draft the rationalisation scenarios

During this step, three rationalisation scenarios (Do Minimum, Do Medium and Do Maximum; see details in Annex 5: Impact assessment) were drafted, as collection of rationalisation actions having the objective to address the deficiencies and opportunities for improvement outlined in the AS-IS analysis. In particular, each scenario was characterized by a different degree of support of the business use cases and of functional integration of the registers.

The rationalisation scenarios were iteratively tested and refined based on the feedback of WP members.

3. Assess the rationalisation scenarios

The three proposed scenarios were assessed based on both qualitative and quantitative methods, ensuring that on one hand, the grouping of rationalisation actions into scenarios was justified by their relative degree of importance and urgency and, on the other hand, that a view on the magnitude of costs and benefits of each of the three scenarios was provided.

4. Select the preferred rationalisation scenario

The alternative rationalisation scenarios were presented to DG MOVE and to RISC in February 2015 and June 2015. The Do Medium was selected.

5. Define the amendments to the registers' specifications and refine the impact assessment for the selected scenario

The rationalisation actions were analysed in higher details by means of forms and the impact assessment was refined based on the detailed input on costs and benefits collected at action level (see Annex 5: Impact assessment). The amendments to the registers' specifications were defined.

3. Stakeholders and their expectations

The main stakeholders of the project are:

- The European Commission (EC),
- The Agency,
- Railway National Safety Authorities (NSAs),
- Registration Entities (REs),
- Railway Undertakings (RUs),
- Railway Infrastructure Managers (IMs),
- Railway Vehicles Owners,
- Railway Vehicles Keepers,
- Railway Entities in Charge of Maintenance (ECMs),
- Railway Manufacturers.

The impact of the proposed changes to the registers' specifications on non-EU OTIF Contracting States was evaluated in the WG with the help of the OTIF Secretary General.

The impact on SMEs (small and medium-sized enterprises) was also taken into consideration.

Stakeholders expressed several **expectations** for the outcome of the RVRR project. All stakeholders stressed the importance to make steps in the direction of a system of registers more efficient and without duplication of data.

Overall, correctness and trustworthiness of data are considered fundamental requirements. Additionally several stakeholders (namely CER, UIP, EIM) pointed the attention to the need to have registers closer to the real business uses of the data.

It has been considered worthwhile to list here below the specific expectations of some working party members:

- EIM considers important to achieve standardized models for the exchange of data.
- UIP and UIRR express the need to move into the direction of clear roles and interfaces and build on existing IT solutions. UIRR also expresses the expectation to achieve a single system for all purposes. UIP suggests seeking for a harmonized data set applied by all NSAs for the vehicle registration in their NVR.

- For UNIFE there are two key elements:
  - The interface with the register of infrastructure for the planning of rolling stock design.
  - The consistency between RDD and ERATV for authorisation purposes with regards to the structure and the numbering of the parameters.
- CER, EIM and UITP put the focus on the interface with the register of infrastructure for running vehicle-infrastructure compatibility check.
- EPPTOLA consider essential that vehicle Owners are involved in, and notified of, activities that pertain to the vehicles that they own.
- For ALE transparency and access to data are key points.
- NSAs are concerned by the cost of the registers (NSA RO, NSA SI, NSA FI) in terms of setup, maintenance and workload. NSA DE and NSA FR wish to go in the direction of the simplification of the registers. Some others (NSA BE, NSA IT) wish to have a single system for all data managed by NSAs. NSA DK invites to analyse the purpose of the registers and evaluate all alternatives to cost-efficiently resolve the problems. NSA ES wishes to achieve a definition of the registers' specifications stable in the long term.
- NSA DE expects that duplication of data across different registers is avoided and a hierarchy between different register and databases is defined. For NSA DE major points are the responsibility for the correctness of data and the access rights.
- NSA FR also remarks that it is fundamental all NVRs are interconnected in order to make available by all NSAs information needed to insure safety as mention in article 33 of Interoperability Directive. The fact that a registration number has been marked on a vehicle is only a presumption of conformity with EU legal rules. Indeed a risk exists since 2010 that a vehicle which has been registered in a Member State and authorized in another one, has been modified without all the NSAs concerned being informed so that they can act quickly in case of incident or accident, or process alerts and take appropriate measures. That's why it recommends interconnecting urgently all NVR to ECVVR and that all registered vehicles have a type assigned in ERATV. NSA FR asks to clarify the purpose of registers as well as the process for keeping them - before actually engaging in the discussion about their characteristics - also in light of the experience from the road and air sector.

- OTIF Secretariat has the expectation to have registers not too complicated and to adopt an approach to rationalisation that starts from the responsibility of the different actors and their need to be in control of the data related to such responsibilities.

- ERFA stresses the crucial aspects of the data exchange among RUs and the need for operational registers that could be used in real time; at the same time they warn against too complicated registers.

4. Expected use of vehicle-related registers

The RVRR WP believes that the registers have a traceability purpose and therefore their primary use is administrative; nevertheless, the registers should be capable to be source of master reference data for other systems.

Also, the RVRR WP has the opinion that the registers, as of today, cannot serve operational uses.

Reference data use means that:

- The data in the registers is accessible via a published interface and used as read-only data by external systems.
- The interface (and the system of registers) is available according to an agreed service level, is web based, specifies name, definition, format of each data element. The information on the last update of each data element is made available.
- The quality of the data in known by means of values of pre-defined quantitative indicators.

In such conditions the user of the reference data is capable to establish a process for the retrieval of data and its use as read-only data with known characteristics.

For a reference data use to be possible a set of preconditions need to be met:

- Change Control Management in place to guarantee full traceability of changes to specifications and IT tools.
- Service level agreement defined (e.g. covering aspects such as availability and system performance).
- Interface (for accessing the data) defined and in place.
- Known characteristics of data (e.g. as result of the availability of maximum timeframes for update, data format conventions, reference data, procedures for data quality assurance and control, data quality indicators).

It appears also that a reference data use is more easily achievable in a centralized architecture of registers.

5. Analysis of the existing situation (AS-IS Analysis)

Although the analysis of the current situation largely reused the findings from t the Studies referred to in [D9] and [D10], several other inputs were collected. The analysis identified issues mainly related to:

- Insufficient availability (ECVVR);
- Specifications and responsibilities for data input not sufficiently clear;
- Insufficient quality of data due to lack of format conventions, missing validation deadlines, obsolete procedures for data collection/exchange (e.g. Paper-based), minimal use of reference data, redundant data, etc.
- Limited usability due to multiple not interfaced IT tools, lack of a common “look and feel”/single sign on/multilingual interface, disaggregated complementary data, etc.
- Absent or unclear provisions regarding notifications on changes;
- Insufficient support to day to day business needs and to the generation of reports.

5.1. AS-IS architecture

The picture below shows the current high level architecture of the vehicle-related registers (AS-IS picture):

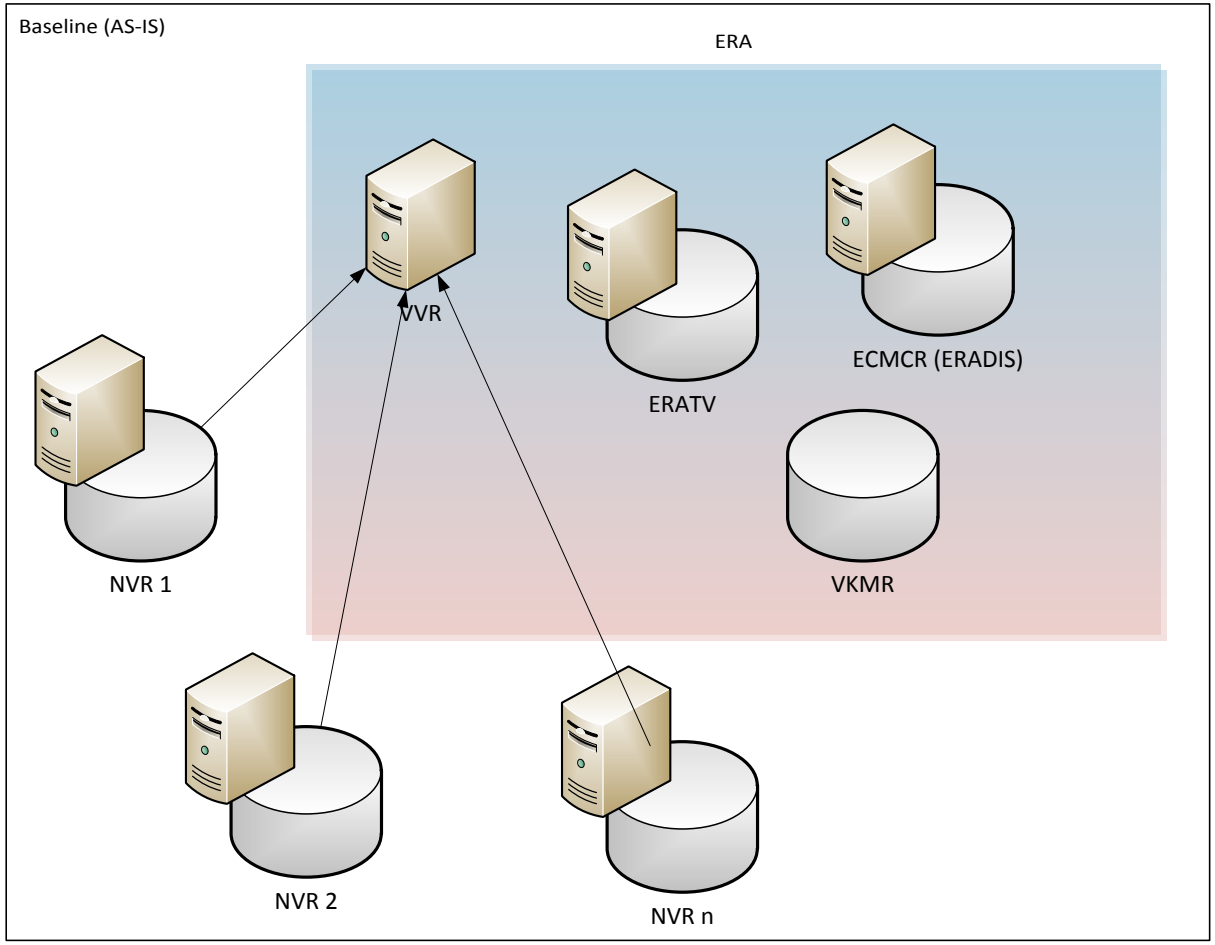


Figure 1: Current high level architecture of the vehicle-related registers (AS-IS picture)

The present architecture is designed for administrative purposes, what is in line with what stated in section 4.8 of the OPE TSI 2012 (Decision 2012/757/EU) concerning registers of infrastructure and vehicles (*"Due to the characteristics of the registers of infrastructure and vehicles, as defined in Articles 33, 34 and 35 of Directive 2008/57/EC, these registers are not suitable for the particular requirements of the operation and traffic management subsystem. Therefore this TSI specifies nothing in respect of these registers. However..."*).

5.1.1. System availability

A legal requirement is set only for the availability of ERATV that shall have a "*target system availability of 98 %. However, in the case of a failure occurring out of normal working hours of the Agency, the restoration of the service shall be handled the next working day of the Agency after the failure. The unavailability of the system shall be minimal during the maintenance*." (ERATV Decision, Annex I, 2.6. Availability).

No requirement is set by the NVR Decision for the system availability of the National Vehicle Registers. If any of the connected NVRs is not available the VVR users gets an informative message in return to his query.

For the registers kept by the Agency the general Terms Of Use (http://www.era.europa.eu/Pages/Terms_Of_Use.aspx) apply.

The table below summarizes the system availability of the vehicle-related registers:

Table 3: System availability of the vehicle-related registers

AS-IS		
Register	**System availability in legal text**	**System availability real**
NVR	Not specified	Unknown
VVR	Not specified	99,925% (Y2013)
ERATV	(target) 98%[1]	99,924% (Y2013)
ECMCR (ERADIS)	Not specified	99,925% (Y2013)
VKMR	Not specified	99,925% (Y2013)
(1) ERATV Decision, Annex I, 2.6. Availability		

5.2. Responsibilities/accountabilities for the data input/update

The table below summarizes the current allocation of responsibilities and accountabilities for the input and update of the data in the vehicle-related registers:

Table 4: Current allocation of responsibilities and accountabilities

Responsibility/accountability for the data input/update			
AS-IS			
Register	**Responsible**	**Accountable**	**Actors to be notified of changes**
NVR	RH (immediately[1]) RE (in timely manner[5])	**RH** **RE**	
ERATV	NSA (by max 20 wdays from decision [2]) Agency (validation against specification and publication by max 20 wdays[2])	**NSA**	Authorising NSAs
ECMCR	Certification Body (by 1 week from decision[3]) Agency (publication[3])	**Certification Body**	
VKMR	Applicant (Keeper) [5] NSA (validation against Appendix 6, Part 1 of NVR Decision[4]) Agency (check uniqueness of VKM and publication on 1st week of month following the request[4])	**Keeper**	

1. Interoperability Directive
2. ERATV Decision
3. ECM Regulation
4. VKM Application Guide
5. NVR Decision

5.3. Additional considerations on the responsibility and accountability for the accuracy and timeliness of the data

5.3.1. NVR

Taking into account the following provisions of the applicable legislation

- The Registration Holder who, "*unless otherwise specified in the registration documents"* (NVR Decision, Annex, 3.2.3.) is the keeper, is responsible for *"immediately declare any modification to the data entered in the national vehicle register, the destruction of a vehicle or its decision to no longer register a vehicle, to the authority of any Member State where the vehicle has been authorised*" (Article 33(3) of Interoperability Directive).
- "*In accordance with Article 14(4)(b) of Directive 96/48/EC and Article 14(4)(b) of Directive 2001/16/EC, Member States shall designate a national body which shall be responsible forthe keeping and updating of the National Vehicle Register. This body can be the National Safety Authority of the Member State concerned. Member States shall ensure that these bodies cooperate and share information in order to ensure that data changes are communicated in a timely manner*" (NVR Decision, Article 4(1)).
- "*The RE must take reasonable steps to ensure the accuracy of the data it enters in the NVR. To this end the RE can request information from other REs, in particular when the entity applying for registration in a Member State is not established in that Member State*" (NVR Decision, Annex, 3.2.2).
- "*As long as Member States' national vehicle registers are not linked, each Member State shall update its register with the modifications made by another Member State in its own register, as regards the data with which it is concerned*" (Article 33(4) of Interoperability Directive).
- "*Should a keeper change, it is the responsibility of the currently registered keeper to notify the RE and the RE has to notify the new keeper of the change of registration. The former keeper is removed from the NVR and relieved of its responsibilities only when the new keeper has acknowledged its acceptance of keeper status. If on the date of deregistration of the currently registered keeper no new keeper has accepted the keeper status, the registration of the vehicle is suspended*" (NVR Decision, Annex, 3.2.3).

- "*In cases where, (…), due to technical changes, the vehicle has to be given a new EVN, the registration holder shall inform of these changes and, if applicable, of the new authorisation for placing in service the RE of the Member State where the vehicle is registered. This RE shall assign to the vehicle a new EVN*" (NVR Decision, Annex, 3.2.3).
- "*When a vehicle equipped with a driving cab already authorised and registered in one Member State is authorised in another Member State, it must be registered in the NVR of the latter Member State. In this case, however, only data relating to items 1, 2, 6, 11, 12 and 13 and, where relevant, data relating to the fields added to the NVR by the latter Member State are to be recorded, as only these data relate to the latter Member State. This provision is applicable as long as the VVR and the links with all relevant NVRs are not fully operational and, during this period, the REs concerned will exchange information in order to ensure that data relating to the same vehicle are consistent.*" (NVR Decision, Annex, 3.2.5(1)).
- "*When there is a change of entity in charge of maintenance, the registration holder as indicated in Article 33(3) of Directive 2008/57/EC of the European Parliament and of the Council, shall inform in due time the registration entity, as defined in Article 4(1) of Commission Decision 2007/756/EC, so that the latter may update the national vehicle register. The former entity in charge of maintenance shall deliver the maintenance documentation to either the registration holder or the new entity in charge of maintenance. The former entity in charge of maintenance is relieved of its responsibilities when it is removed from the national vehicle register. If on the date of de-registration of the former entity in charge of maintenance any new entity has not acknowledged its acceptance of entity in charge of maintenance status, the registration of the vehicle is suspended.*" (ECM Regulation, Article 5(8)).
- "*Without prejudice to paragraphs 3 to 5, entities in charge of maintenance for freight wagons registered in the national vehicle register by no later than 31 May 2012 shall be certified in accordance with this Regulation by no later than 31 May 2013.(…)*" (ECM Regulation, Article 12(6)).
- "*The safety authority shall be entrusted with at least the following tasks: (...) supervising that vehicles are duly registered in the NVR and that safety related information contained therein, is accurate and kept up to date*" (Safety Directive, Article 16(2g)) – in most of the cases the RE is the NSA.
- "*Each vehicle, before it is placed in service or used on the network, shall have an entity in charge of maintenance assigned to it and this entity shall be registered in the NVR in accordance with Article 33 of the Railway Interoperability Directive.*" (Safety Directive, Article 14a(1))

the following conclusions are shared by the WP Members:

- The REs have a duty to check the accuracy of the data entered in the NVR.
- In order to ensure the accuracy of such data, the RE should perform checks regarding plausibility and completeness. Only in case flaws have been identified, the RE uses the means that are at its disposal (technical files and other information in its possession) or that are easily accessible (using its access rights to other railway registers) or by contacting other REs/NSAs. However, the checks of the RE do not relieve the RH from its responsibility to provide correct datasets over the whole lifecycle of the vehicle. All this should be done within a "reasonable" time-frame in the absence of clear deadlines imposed on the REs. The reasonable time frame can only be realized if no deeper investigations on data quality will be necessary.
- As it is the responsibility of the registration holder to inform the REs - using the standard form defined in Appendix 4 of the NVR Decision and "*for certain cases, additional documents in either paper or electronic form*" (NVR Decision, Annex, 3.2.3) if requested by the RE - about any change to the registered data, it seems excessive to require from the REs to check that such data remain correct at all time.
- It seems a prerequisite of the duty to keep the NVR updated that the REs is informed about a change to the data by either the registration holder *immediately* or by another RE (case described in NVR Decision, Annex, 3.2.5(1)) "*in a timely manner*".
- After the registration, it is the sole responsibility of the Registration Holder to ensure that the data remain correct and up to date by immediately declaring any modification to the data entered in the national vehicle register, the destruction of a vehicle or its decision to no longer register a vehicle
- In the case of freight wagons, it is implicit that the ECM must hold a valid ECM Certificate: it is checked by the RE at the time of first registration and at each update of the NVR record following the change of ECM (ECM Regulation, Article 5(8)).
- There is a particular responsibility of the keeper (even if not the registration holder) to make sure that the vehicle is compliant with the legislation in force and thus that data stated in the NVR is correct (and that the ECM for freight wagons holds a valid certificate in accordance with Art 14 (a) of the Safety Directive and ECM Regulation).
- Suspension and revocation of ECM certificates imply that the ECM registered in NVRs is not compliant anymore to the legislation in force and therefore that the registration of the freight wagon should be suspended forbidding the latter to be operated.
- No doubt that the registration holder and the keeper could be held liable towards the RU or IM operating a freight wagon in case the information in the NVR is not up to date.
- Another aspect to consider is that the purpose of the NVR is administrative to enable the authorities to have access to the data contained therein in order to make possible controls.

Hence it would be unreasonable for any entity having access thereto to assume without further checks and precautions that the data therein are correct and up to date in all respects.

5.3.2. ERATV

Taking into account the following provisions of the applicable legislation:

- According to Article 34 of the Interoperability Directive, "*the Agency shall set up and keep a register of types of vehicles authorised by the Member States for placing in service on the Community rail network*".
- "*The Member States shall make sure that the national safety authorities provide the information on the type authorisations they have granted, as set out in Annex II.*" (ERATV Decision, Article 3(1))
- "*The national safety authority shall inform the Agency of any authorisation of a new type of vehicle within 20 working days following the issue of the authorisation.*" (ERATV Decision, Annex I, 5.2.1)
- NSAs have to update the register and must inform the Agency of any change within 5 to 20 working days (depending on the nature of the change). The Agency will have from 5 to 10 working days to check the information received.
- The Agency performs the "*Validation regarding the compliance with this specification and publication of the data submitted by a national safety authority.*" (ERATV Decision, Annex I, 2.3)
- "The Agency shall check the data submitted by the national safety authority regarding their compliance with this specification, and either validate them or request a clarification" (ERATV Decision, Annex I, 5.1).
- "*The Agency shall check the information submitted by the national safety authority and within 20 working days following the receipt of this information either validate it and assign a type of vehicle number as set out in Annex III or request its correction or clarification. In particular, in order to prevent an unintended duplication of types in ERATV, the Agency shall check, as far as the data available in ERATV allows, that this type has not been registered before by another Member State.*" (ERATV Decision, Annex I, 5.2.1)
- In case of modification of an existing authorisation "*The Agency shall check the information submitted by the national safety authority and, within 10 working days following the receipt of this information, shall either validate it or request its correction or clarification. In particular, the Agency shall check that the requested changes actually consist of a modification of an authorisation of an existing type (e.g. amendment of conditions of the authorisation,*

amendments of the type examination certificate) and do not constitute a new type of vehicle." (ERATV Decision, Annex I, 5.2.1)

- "*Before requesting a modification of an authorisation which may lead to a modification of a registered type of vehicle, the national safety authority shall coordinate with national safety authorities who have granted authorisation for this registered type, and in particular the authority who has registered the type in ERATV.*" (ERATV Decision, Annex I, 5.2.8)
- *"The values indicated for the parameters related to the technical characteristics shall be those recorded in the technical documentation accompanying the type examination certificate*" (Annex II to ERATV Decision)
- *"For the types of vehicle that are not in conformity with all the relevant TSIs in force, the national safety authority that has granted the type authorisation may limit the information to be provided on the technical characteristics indicated in Section 4 below to the parameters that have been checked according to the applicable rules"* (Annex II to ERATV Decision)
- In the case of types of vehicles authorised before 19 July 2010 "*data to be recorded may be limited to the parameters that have been verified during the type authorisation process*" (ERATV Decision, Article 2(3)); in the case of voluntary registration described in ERATV Decision, Annex 1, 1., the "*data to be recorded may be limited to the parameters that have been verified during the authorisation process.*"

the following conclusions are shared by the WP Members,:

- The ERATV Decision does not contain a provision similar to NVR Decision, Annex I, 3.2.2 ("*The RE shall take reasonable steps to ensure the accuracy of the data it enters in the NVR.*") according to which the NSA would be obliged to take *reasonable steps to ensure the accuracy of the data* it enters in the ERATV.

- This does not mean that NSAs are relieved from any duty to check the correctness of at least part of the data registered in ERATV. As most of the data were checked during the verification and authorisation processes, NSAs could limit their checks to plausibility and completeness of the data to be registered.

- In the case of parameters that have not been verified because they are not specified in the rules relevant for authorisation, the values for these parameters do not even need to be recorded in ERATV; in such case there is no liability issue with respect to such parameters.

- In the absence of a clear provision in that respect in the ERATV Decision, the test would probably be along the line: how easily can the NSA check a data before entering it in the register? In the case of information that the NSA possesses and which can easily be checked, the liability would

be greater than in the case of an information which the NSA doesn't have or that it cannot easily check with the means at its disposal.

- Data that had to be checked by the NSA during the authorisation process of a vehicle are under the control of the NSA: "*For the types of vehicle that are not in conformity with all the relevant TSIs in force, the national safety authority that has granted the type authorisation may limit the information to be provided on the technical characteristics indicated in Section 4 below to the parameters that have been checked according to the applicable rules*" (Annex II to ERATV Decision).This is not the case for data which were checked and confirmed by others (NoBos, DeBos, the applicant for APS, ..) that the NSA doesn't have to recheck; for example, the NSA should in principle bear no liability with respect to the parameters related to the technical characteristics of the vehicle that were checked by others: "*The values indicated for the parameters related to the technical characteristics shall be those recorded in the technical documentation accompanying the type examination certificate*" (Annex II to ERATV Decision).

- Similarly with respect to the parameter Conformity with TSI which must be assessed by an "'*EC type examination certificates' (if module SB applied) and/or 'EC design examination certificates' (if module SH1 applied)*" (Annex II to ERATV Decision).

- The accountability of the NSAs should be greater with respect to modifications, suspensions and withdrawals of an authorisation of type they have granted, if such changes are not technical changes to the type of vehicle.

- if there is a modification to the data other than those strictly related to section 3 "authorisation" or specific cases, the NSA that intends to introduce this modification must agree it with all other NSAs that authorised this type of vehicle before the modification is communicated to Agency.

5.4. Comparative analysis concerning the accuracy of the data in NVR, ERATV, VKMR and ECMCR.

5.4.1. NVR

The data is submitted by the "*entity applying for the vehicle registration*" (NVR Decision, Annex I, 3.2.1.) via the standard form set out in Appendix 4 of NVR Decision. Supporting documents are attached if requested by the RE ("*The use of the standard form might not be sufficient for certain cases. If necessary, the RE concerned may therefore submit additional documents in either paper or electronic form.*" (NVR Decision, Annex I, 3.2.3.).

After the submission, "*the RE must take reasonable steps to ensure the accuracy of the data it enters in the NVR. To this end the RE can request information from other REs, in particular when the entity applying for registration in a Member State is not established in that Member State*" (NVR Decision, Annex I, 3.2.2.).

In case of vehicles authorised in several Member States *"the REs concerned will exchange information in order to ensure that data relating to the same vehicle are consistent*"(NVR Decision, Annex, 3.2.5.(1)).

The NSA shall "*supervise that vehicles are duly registered in the NVR and that safety related information contained therein, is accurate and kept up to date*" (Safety Directive, Article 16(2c)).

The certified ECM "*shall be capable to prove they have checked the accuracy of the data in the NVRs that concerns the vehicles they are in charge*". (ECM Regulation, Annex III, 7.4.).

5.4.2. ERATV

The data ("*related to granting an authorisation for a new type of vehicle*") is submitted by the NSA (ERATV Decision, Annex I, 5.1) via a standard web-based electronic form.

The data is validated (ERATV Decision, Annex I, 2.3 and 5.1) by the Agency "*regarding the compliance with this* (ERATV) *specification*". Additionally the Agency has the duty to check, *as far as the data available in ERATV allows*, that the submitted type has not been registered before by another Member State (ERATV Decision, Annex I, 5.2.1 "*In particular, in order to prevent an unintended duplication of types in ERATV, the Agency shall check, as far as the data available in ERATV allows, that this type has not been registered before by another Member State.*") and to check the possible missed detection of new types by the NSA (ERATV Decision, Annex I, 5.2.3 "*the Agency shall check that the requested changes actually consist of a modification of an authorisation of an existing type (e.g. amendment of conditions of the authorisation, amendments of the type examination certificate) and do not constitute a new type of vehicle*".)

The authorizing NSAs shall agree on the changes to the data of a registered type ("*Before requesting a modification of an authorisation which may lead to a modification of a registered type of vehicle, the national safety authority shall coordinate with national safety authorities who have granted authorisation for this registered type, and in particular the authority who has registered the type in ERATV.*"(ERATV, Annex I, 5.2.8.))

The ERATV technical data is part of the technical file submitted by the applicant for the EC-type examination:

- Commission Decision 2010/713/EU [L11] on modules states that the application lodged by the application for EC-type examination with a notified body "*shall include (...) a separate file with the set of data required by the TSI(s) for each relevant register provided for in Articles 34 and 35*

of Directive 2008/57/EC".

- The TSIs (e.g. as modified by Decision 2012/462/EU) add that the data to be provided "*The data to be provided for the register provided for in Articles 34 (…) of Directive 2008/57/EC are those indicated in (…) Commission Implementing Decision 2011/665/EU of 4 October 2011 on the European register of authorised types of railway vehicles*" that is, the applicant shall provide the data, on separate files but within the technical dossier, in the format specified by the ERATV decision.
- Consistently ERATV Decision, Annex II, states that "*The data to be registered in ERATV for each type of vehicle and their format shall be as indicated below. (…) The values indicated for the parameters related to the technical characteristics shall be those recorded in the technical documentation accompanying the type examination certificate. In the cases where possible values for a parameter are limited to a predefined list, these lists shall be maintained and updated by the Agency. For the types of vehicle that are not in conformity with all the relevant TSIs in force, the national safety authority that has granted the type authorisation may limit the information to be provided on the technical characteristics indicated in Section 4 below to the parameters that have been checked according to the applicable rules*" and (Annex II, footnote 4) "*For parameters indicated as 'optional', indication of data shall be subject to the decision of the applicant for the type authorisatio*n."

5.4.3. VKMR

The registration application is submitted by the keeper on paper to the NSA who validates the request against the allocation rules defined in Appendix 6, Part 1 of Decision 2007/756/EC and forwards it to the Agency for publication in the VKMR. In OTIF non-EU Member States the registration application is submitted by the keeper on paper to the Competent Authority who validates the request against the allocation rules defined in Appendix 6, Part 1 of Decision 2007/756/EC and forwards it to the OTIF Secretary for publication in the VKMR. The Agency and the OTIF Secretary before publication in the VKMR check that the proposed VKM is unique (not yet assigned to another keeper).

5.4.4. ECMCR (ERADIS)

The data is submitted by the Certification Body following Article 10(3) of the ECM Regulation by means of a standard web-based electronic form. The data is validated by the Agency regarding the compliance with the format of the data specified in Annex V of the ECM Regulation and the consistency with the reference data in ERADIS, and then published (Article 10(4) of the ECM

Regulation).

5.5. Comparative analysis concerning the timeliness of the data in the NVR, ERATV, VKMR and ECMCR

5.5.1. NVR

The volatility of NVR data is estimated to be low; additionally, changes are normally known in advance (e.g. in the case of a change or ECM).

The maximum timeframe allocated to the RE for the registration/update of the data - after the receipt of a valid application for registration/modification from the RH - is not set by the NVR Decision.

On the other hand, the case described in NVR Decision, Annex, 3.2.5.(1) Authorisation in several Member States (*"(…) the REs concerned will exchange information in order to ensure that data relating to the same vehicle are consistent*") gives an example of cooperation among REs.

In such circumstances Article 4 of NVR Decision 2007/756/EC states "*Member States shall ensure that these bodies* (the REs) *cooperate and share information in order to ensure that data changes are communicated in a timely manner*".

By analogy, it is reasonable to say that the RE is expected to process *in a timely manner* the requests for the registration/update of the NVR.

On the side of the Registration Holder, the latter:

- "*shall immediately declare any modification to the data entered in the national vehicle register*" (Interoperability Directive, Article 33(3))
- "*When there is a change of entity in charge of maintenance, the registration holder as indicated in Article 33(3) of Directive 2008/57/EC of the European Parliament and of the Council (1), shall inform in due time the registration entity, as defined in Article 4(1) of Commission Decision 2007/756/EC (2), so that the latter may update the national vehicle register. (…)*" (ECM Regulation, Article 5(8)).

Consequently, in case of any planned change (e.g. change of keeper/owner/ECM), the Registration Holder shall inform *in due time* the Registration Entity.

5.5.2. ERATV

The current legal framework sets out that the maximum timeframe for the NSAs for the input of the data is 20 working days; in particular the national safety authority shall inform the Agency of:

- "any *authorisation of a new type of vehicle within 20 working days following the issue of the*

authorisation" (ERATV Decision, Annex I, 5.2.1).

- "any *authorisation of a type of vehicle already registered in ERATV (such as a type authorised by another Member State) within 20 working days following the issue of the authorisation*" (ERATV Decision, Annex I, 5.2.2).
- "*any modification to an existing authorisation for a type of vehicle within 20 working days following the issue of the modification to the authorisation*" (ERATV Decision, Annex I, 5.2.3).
- "*any suspension of an existing authorisation for a type of vehicle within 5 working days following the issue of the suspension of the authorisation*" (ERATV Decision, Annex I, 5.2.4).
- "*a reactivation of an authorisation for a type of vehicle previously suspended within 20 working days following the issue of the reactivation of the authorisation*" (ERATV Decision, Annex I, 5.2.5).
- "*a reactivation (with modification) of an authorisation for a type of vehicle previously suspended within 20 working days following the issue of the reactivation of the authorisation*" (ERATV Decision, Annex I, 5.2.6).
- "*any withdrawal of an existing authorisation for a type of vehicle within 5 working days following the withdrawal of the authorisation*" (ERATV Decision, Annex I, 5.2.7).

Similarly, maximum timeframes are set by the ERATV Decision for the "*validation regarding the compliance with this specification and publication of the data*" (ERATV Decision, Annex I, 2.3) by the Agency.

The following table summarizes the timeframes:

Table 5: ERATV Timeframes

ERATV Timeframes		
Event	Submission of data by NSA	Validation against specification and publication by Agency
Authorisation of a new type	20 wdays from decision	20 wdays from receipt
Authorisation of a registered type	20 wdays from decision	10 wdays from receipt
Modification of existing authorisation	20 wdays from decision	10 wdays from receipt
Suspension of existing authorisation	5 wdays from decision	5 wdays from receipt

ERATV Timeframes		
Event	Submission of data by NSA	Validation against specification and publication by Agency
Reactivation of a suspended authorisation without modification	20 wdays from decision	10 wdays from receipt
Reactivation of a suspended authorisation with modification	20 wdays from decision	10 wdays from receipt
Withdrawal of existing authorisation	5 wdays from decision	5 wdays from receipt

A system of automatic email notifications to all authorizing NSAs and the Agency is established by ERATV Decision, Annex I, 5.8. Automatic notification of changes.

5.5.3. VKMR

The process for updating the VKMR is briefly described in section 0

As stated in the VKM Application Guide, the updates are published on the first Wednesday of every month.

Nothing is specified about the maximum timeframe allocated to the NSAs or OTIF Competent Authorities/OTIF Secretary to forward to the Agency the requests received from the keepers.

5.5.4. ECMCR (ERADIS)

The current legal framework sets out that the maximum timeframe for the Certification Body for the notification to the Agency of decisions concerning ECM certificates is 1 week:

- "*Certification bodies shall notify the Agency of all issued, amended, renewed or revoked ECM certificates or certificates for specific functions according to Article 4(1), within 1 week from its decision, using the forms in Annex V*" (ECM Regulation, Article 10(3))
- "*The Agency shall keep a record of all information notified under paragraphs 2 and 3 and shall make it publicly available.*" (ECM Regulation, Article 10(3))

The timeframe allocated to the Agency for the publication of the data submitted by the Certification Body is not specified.

5.6. Model of vehicle-related data

The picture below provides a logical description of the data in the vehicle-related registers.
It is evident that the data concerning organizations is kept separately in each register; therefore the data for the same organization may be recorded several times, with consequent inefficiency and risk of inconsistencies.

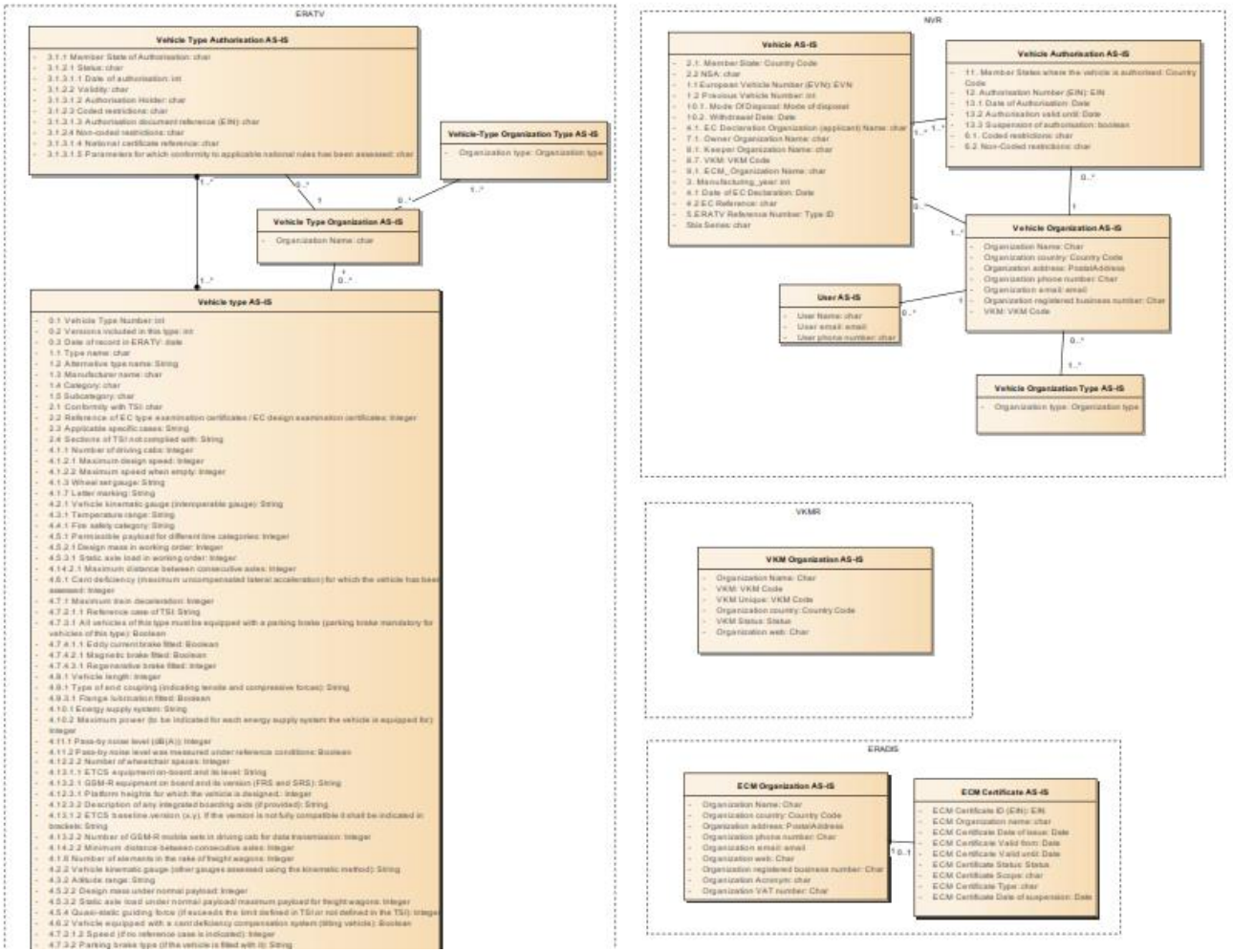


Figure 2: Model of vehicle-related data

5.7. Business use cases of the vehicle-related registers

The list of business use cases relevant for the task has been drafted during the inception phase by means of phone calls with volunteered WP Members (NSA DK, NSA ES, NSA FR, NSA SI, CER, UIP, UITP, UNIFE), documents provided by other Members (NSA DE) and workshops run in occasions of the first two WP meetings. The list was further worked out during the intermediate and final phase of the project. See section 6.8 for more details on the collected list of business use cases and the new use cases supported in the rationalised system of vehicle-related registers.

6. Proposed rationalization

6.1. Baseline scenario: Do Nothing

The baseline scenario explains how the current situation of the vehicle related registers would evolve without additional intervention. Considering the fact that there is already an EU legal framework in place, the baseline would be the continuation of the current framework without any change to the register's specifications.

Some of the identified rationalisation actions (see 6.3) that do not require amendments to the specifications may be anyway implemented subject to budget availability and with priorities to be agreed with stakeholders on a case by case basis. In broad lines, this would mean:

NVR and ECVVR:

Redundancy of data due to the multiple registrations of vehicles with driving cab. Not harmonized implementation of the NVR Decision (different registration datasets, different practice concerning the Registration Holder). Inconsistency of data due to limited use of reference data. Voluntary notification of data changes by REs. No maximum duration of the registration process. No tools in place to monitor and improve the data quality. No data format conventions. Rigid management of codes of restrictions and of the codes of the type of documents for the EIN. Limited user-friendliness of the tools (no web-services, no multilingual interface, no web-based forms). Difficult or no access to data from other registers: no single access point, difficult aggregation of complementary data.

ERATV:

No identification and contact data of the Authorisation Holder. No synchronization of the list of reference parameters with RDD.

VKMR:

Manual input of data. Publication once per month. No use as reference data in NVRs.

ECMCR:

Data available only via direct web consultation in ERADIS. Data not available in VVR searches or VVR reports. Publication as soon as possible.

6.2. Rationalised system of vehicle-related registers

This chapter describes the envisaged rationalisation of the vehicle-related registers. This rationalization scenario corresponds to the scenario “Do medium” (see Annex 5: for more details on the selection of the preferred scenario)

A “rationalisation scenario”, also referred as “scenario” encloses a group of “rationalisation actions”.

If not otherwise specified in this report, the term “action” means “rationalisation action”. Each action is identified by an Action ID.

Starting from the collected business requirements, the actions were identified by the RVRR WP in order to realize such requirement (e.g. to fix an issue).

The actions aim at:

- improving data quality (completeness, accuracy, consistency, timeliness);
- clarifying where needed the registers’ specifications in order to separate responsibilities or streamline the processes;
- facilitating the access to information;
- improving the usability of the registers and the overall user experience;
- improving the support of registers to the business use cases

6.2.1. TO-BE architecture

The picture below outlines the high level architecture of a rationalised system of vehicle-related registers.

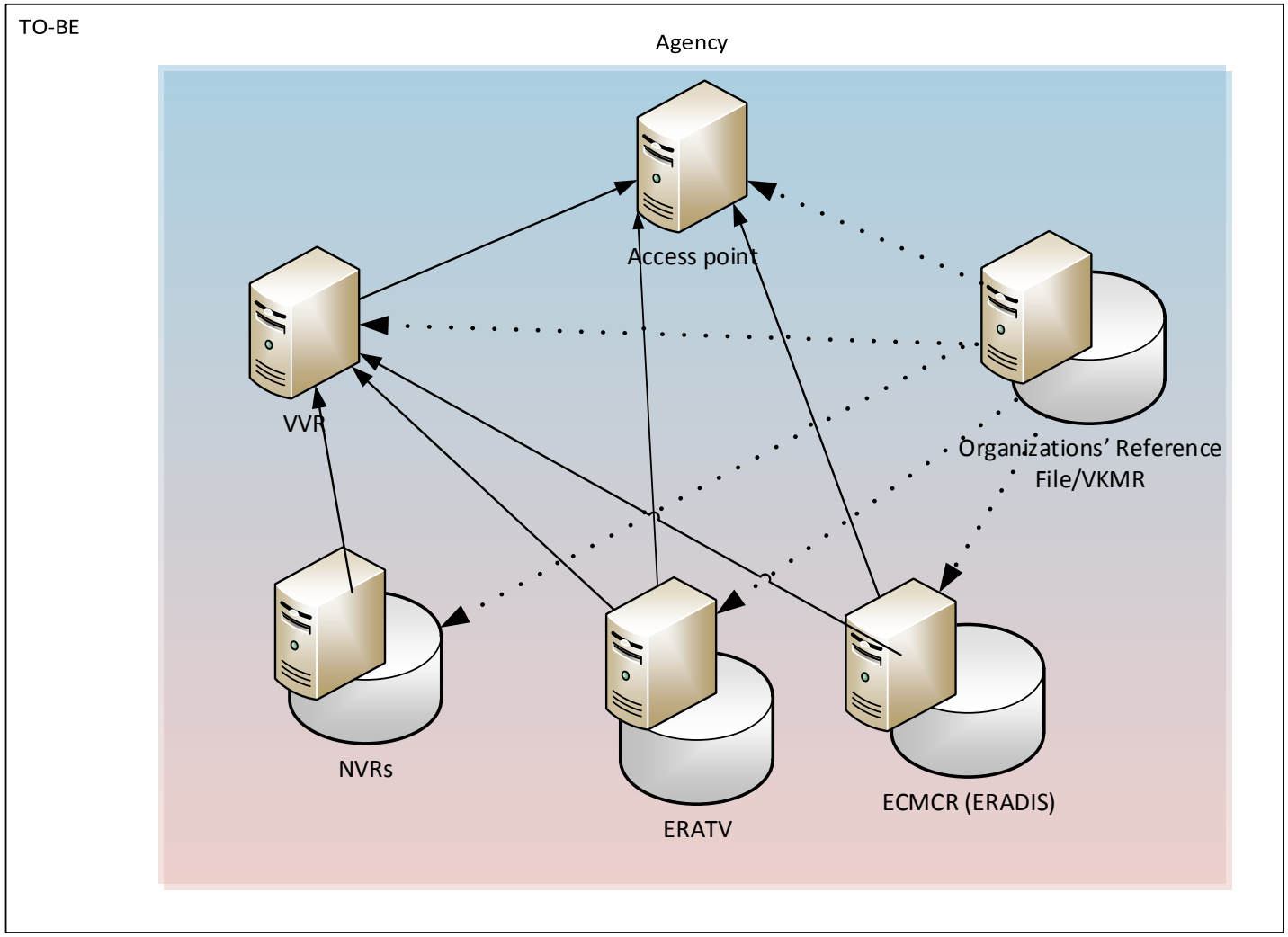


Figure 3: High level architecture of the rationalised system of vehicle-related registers

6.2.2. The Organisation Reference File

The Organisation Reference File is a repository of organisation data kept by the Agency and including for each organisation the organisation code (a unique 4-position alphanumeric identifier) assigned by the Agency and other identification and contact data.

Once setup, the Organisation Reference File will incorporate VKMR.

All organisations accessing NVR or identified therein will be required to be assigned an organisation code. Similarly, manufacturers and authorisation holders in ERATV, keepers in VKMR and certified ECMs in ECMCR will be assigned an organisation code.

6.2.3. The Single Access Point

The Access Point is unique web-based application enabling users of vehicle-related registers to run easily some predefined types of enquiries: the entry access point application will manage the communication to each register (via web-services), aggregate the data and return the result of the enquiry to the user.

6.3. Rationalisation actions

Details on the rationalisation actions can be found in Annex 6 Rationalisation Actions Forms.

ID	Action title	Description
1	**Remove the provisions of the NVR Decision requiring the additional registration of vehicles with driving cab and of vehicles from non-EU OTIF NVRs connected to ECVVRs.**	
	Situation	- The provision in NVR Decision, Annex, 3.2.5 (1) “Authorisation in several Member States”, requires, as long as the NVR of first registration is not connected to ECVVR, to register vehicles with driving cabs in each Member State issuing an additional authorisation. The situation results in multiple registrations, inconsistencies and administrative overhead. - According to the NVR Decision, Annex, 4.1.2 and 3.2.1, vehicles from third countries entering the EU rail network shall be registered in the NVR of the first Member State that authorised the vehicle to be placed in service on the European Union rail network. The situation is source of administrative overhead in case of vehicles already registered in an OTIF NVR connected to ECVVR. In fact, in such case the vehicle information is already available without delays in ECVVR.

ID	Action title	Description
	Action	- The provision 3.2.5 (1) is no longer applicable as currently all NVRs are connected to VVR. Therefore, the provision will be removed from the amended NVR Decision. Existing additional registrations of vehicle with driving cabs shall be withdrawn (with code 20) by the keepers over a period of 1 year from the entry into force of the amended NVR Decision. - The NVR Decision will be modified to not require anymore the additional registration in an EU NVR of vehicles coming from third countries and already registered in an NVR in line with the NVR Specification and connected to ECVVR. Existing additional registrations shall be withdrawn (with code 20) by the keepers over a period of 1 year from the entry into force of the amended NVR Decision.
2	**Analyse the custom fields requested by Member States at the time of registration in the NVR in order to identify common elements to be possibly added to the harmonized NVR dataset**	
	Situation	The dataset that is provided by the applicant for a vehicle registration in the NVR may differ in the various Member States.
	Action	The references to the “additional fields” that may be added to the NVR are removed from the amended NVR Decision. The “Manufacturer Serial Number” is identified as a common additional data element (see action id 4).
3	**Require, for all kinds of vehicles, the new ECM to acknowledge the acceptance of the ECM status**	
	Situation	The provision of supporting documents is not mandatory in all cases of change to a vehicle registration in the NVR. The situation results in the risk of incorrect designation of organization to the roles specified in the Standard Form for Registration in the NVR.
	Action	The amended NVR decision, will specify that, in case of change of ECM the procedure set in ECM Regulation, Article 5(8) requiring the acknowledgement of acceptance of the ECM status by the new ECM, shall be followed whatever the kind of vehicle concerned.
4	**Add the manufacturer serial number as optional data element in NVR.**	
	Situation	The EVN is assigned at the time of the registration in the NVR and therefore painted on the vehicle. Before that, the vehicle is identifiable via the manufacturer serial number. After that, the manufacturer serial number helps to recognize and prevent illicit substitutions of vehicles.
	Action	In the amended NVR Decision, the manufacturer serial number will be added as optional item in NVR dataset.
5	**Send notifications of NVR data changes to organizations concerned by the change**	
	Situation	The organizations identified in the NVR registration (Keeper, Owner, ECM, EC declaration of verification issuing body (the applicant)) and the concerned NSAs (i.e. NSAs that issued an authorisation for the vehicle or NSAs of Member States where the vehicle is authorised) are interested in being notified in case of changes to the registration data.
	Action	The amended NVR Decision will provide for the NVR tools to implement automatic email notifications of changes to the concerned organizations. An OPT-IN mechanism is envisaged.

ID	Action title	Description
6	**Define and enforce data format conventions.**	
	Situation	General data format conventions covering aspects such as format of dates and separators are not defined for the vehicle-related registers.
	Action	Data format conventions are defined for dates (ISO 8601) and country codes (Interinstitutional style guide) and enforced in the amended NVR Decision.
7	**Provide data quality reports in VVR.**	
	Situation	The NVR data must be correct. However, an inspection of the data via VVR reveals data anomalies such as mandatory data elements not filled, formats not compliant with the specifications, inconsistencies with reference data.
	Action	Data quality reports identifying the data anomalies will be produced by VVR, either automatically or on-demand, and made available to the Registration Entities. Checks performed by the data quality reports are define for all NVR parameters and concern completeness, format compliance and consistency with reference data.
8	**Set a maximum timeframe for the registration of changes in the NVR and the publication of data in ECMCR. Clarify the scope of the validation by Agency in ECMCR and VKMR.**	
	Situation	The NVR Decision does not specify any maximum timeframe for the update of the NVR after the receipt of a complete registration form.
	Action	The amended NVR Decision will specify that REs shall update the NVR in a maximum of 20 working days from the receipt of a complete application file. The application guides of ECMCR and VKMR will specify that the Agency, before publication, shall carry out a validation regarding the compliance with the format of data set in the specifications and the consistency with the reference data.
9	**Specify that the Registration Holder in NVR is the (registered) keeper.**	
	Situation	The Registration Holder (RH), in the meaning of Article 33(3) of Directive 2008/57/EC, may be different from the owner or keeper. It is therefore unclear who is entitled to be RH.
	Action	The amended NVR Decision will specify that the keeper of the vehicle is the “registration holder” in the meaning of Article 33(3) of Directive 2008/57/EC.
10	**Collect emails in NVR for all organizations identified in the vehicle registration.**	
	Situation	According to NVR Decision, only the email address of the ECM shall be specified in the registration form.
	Action	The amended NVR Decision will require the mandatory provision, in case of new registrations, of the emails of the other organizations identified in the registration: Keeper, Owner and EC declaration of verification issuing body (the Applicant).
11	**Add identification and contact data of the Authorisation Holder in ERATV.**	
	Situation	For the type Authorisation Holder, only the organization name is recorded in ERATV.
	Action	The amended ERATV Decision will require the provision, in case of new records, of the identification and contact data of the Authorisation Holder: registered business number, organization code, full address, email address. The same information may be voluntarily supplied for the Manufacturer.

ID	Action title	Description
12	**Add ECM, OTIF Secretary General, OTIF Competent Authorities, EC Declaration of Verification Issuing Body in the table 3.3 of Annex of the NVR Decision.**	
	Situation	The ECM should have access to the data for vehicle for which it is the ECM. Following the EU accession to COTIF and the obligation set in the OTIF NVR Specification to connect the NVRs of non-EU OTIF Contracting States to ECVVR, OTIF Secretary General and OTIF Competent Authorities should have access to ECVVR.
	Action	The table of access rights in the amended NVR Decision will specify the access rights of ECM, OTIF Secretary General, OTIF Competent Authorities, EC Declaration of verification issuing body Furthermore, the access rights of Other Legitimate Users will be slightly modified to allow for a more flexible approach for the recognition of Other Legitimate Users by means of a transparent change control procedure.
13	**Enable IMs/RUs to search by list of max 50 EVNs.**	
	Situation	The NVR Decision allows RUs/IMs to access data only by single EVN. On the other hand, RUs/IMs need to check the administrative status of vehicles (e.g. registration status, statuses of the authorisations issued to the vehicle by the Member States, keeper and ECM data, etc.) for all vehicles in a train.
	Action	The amended NVR Decision will allow RUs/IMs to search by lists of EVNs.
14	**Implement web services in VVR for machine-to-machine consultation of data.**	
	Situation	Access to VVR is possible only via the VVR web interface.
	Action	Web-services will be implemented in VVR to support the machine-to-machine consultation of data by authorised users.
15	**Implement a VVR multilingual user interface.**	
	Situation	VVR tool has no multilingual capabilities, i.e. there is no possibility to incorporate translations of the labels of the web interface and have them displayed appropriately based on the language settings of the user's browser.
	Action	VVR will implement a multilingual user interface. Translation files will be compiled by the Registration Entities.
16	**Rationalise the management of restrictions in NVR.**	
	Situation	The list of restriction codes is kept in Appendix 1 to the NVR Decision and, following Article 4 of ERATV Decision, in a document published on the Agency website.
	Action	The table of restriction codes will be removed from the amended NVR Decision and kept on the Agency website. The amended NVR Decision will specify the rules for the addition/removal of restriction codes and will clarify that the list applies to both NVR and ERATV.
17	**Implement access to ECM Certificate data via VVR**	
	Situation	The registration in the NVR includes the information on the ECM associated to the vehicle. For wagons, the information on ECM Certificates of the ECM is kept in ECMCR (ERADIS).
	Action	VVR will implement a functionality to display the ECM Certificate information retrieved from ECMCR (ERADIS) in the vehicle details page.

ID	Action title	Description
18	**Implement search by Vehicle Type ID in VVR.**	
	Situation	The VVR tool does not currently support the search by vehicle type (field 5. Reference allowing retrieval of the relevant technical data from ERATV)
	Action	VVR search functionality will be enhanced to support the search by Vehicle Type ID.
19	**Add to the NVR Specification the date of suspension of authorisation, the date of revoke of authorisation.**	
	Situation	The authorisation data kept in the NVR does not allow to trace all status of the vehicle authorisation.
	Action	The amended NVR Decision will introduce some additional fields concerning the authorisation: Date of suspension, Date of revoke.
20	**Implement a functionality in standard NVR to schedule changes of owner/keeper/ECM.**	
	Situation	The change of keeper/ECM are normally scheduled in advance. The RE must action the change of on the specified date of de-registration.
	Action	sNVR will implement a functionality to schedule the change of Keeper/ECM/Owner
21	**Removal of typos and clarifications in the NVR Decision.**	
	Situation	The provisions in the NVR Decision on the transfer of registration are not clear. Field “11. Member States Where the vehicle is authorised” contains, besides of the list of Member States, also the information on the additional conditions applicable to the vehicle (RIC, RIV, TEN, other “bilateral or multilateral agreements”). The EIN specification and the codification of the types of documents are described in the NVR Decision and in other legal texts.
	Action	The amended NVR Decision will contain a new provision on the transfer of registration to a different NVR. The EIN specification and the codification of the types of documents (for the EIN) will be moved out of the NVR Decision to a technical document maintained on the Agency website; this would enable the possible extension of the EIN codification to other types of documents such as EC Declarations and EC Certificates. The amended NVR Decision will provide for a separate field “11bis Additional conditions applicable to the vehicle” to record the information on RIC, RIV, TEN, TEN-CW, TEN-GE and other bilateral or multilateral agreements.
23	**Implement VVR reports aggregating data from the vehicle-related registers.**	
	Situation	Vehicle-related information is currently distributed among ECVVR, ERATV, VKMR and ECMCR (ERADIS).
	Action	VVR will implement reports, on the basis of the identified use cases, which aggregate data from the vehicle-related registers. Reports may be generated automatically or on-demand.
24	**Implement an IT tool for the VKMR. Set a maximum timeframe for the validation of requests.**	

ID	Action title	Description
	Situation	VKMR is currently implemented with an Excel spreadsheet. Requests for update are handled manually and the register is updated once per month.
	Action	A VKMR IT tool will be developed (possibly incorporated in the Organization Reference File, see Action 30) and will include an electronic submission form. Once the VKMR IT tool is in operation, a maximum timeframe of 20 working days will be allocated to the Agency to update the VKMR after the receipt of a complete application file.
25	**Add the VKM list as reference data in standard NVRs.**	
	Situation	Keeper's information and VKM code are available in VKMR; on the other hand, the keeper's information is also recorded in NVR within the vehicle registration. The situation may result in inconsistencies.
	Action	The VKMR data will be integrated as reference data in the VVR and distributed to the standard NVRs via the existing functionality to update the reference data
27	**Synchronize of ERATV and RDD lists of parameters for which conformity is assessed according to notified national rules.**	
	Situation	The list of parameters set out in Annex to Decision 2009/965/EC as amended by Decision (EU) 2015/2299 is implemented in both ERATV and RDD.
	Action	A change control procedure will avoid the de-synchronization of the two implemented lists.
29	**Implement electronic web-based multilingual form in standard NVR for submission of registration/modification applications.**	
	Situation	The way the data is submitted to the RE by the applicant for a new NVR registration or a change to an existing NVR registration varies from MS to MS: paper, digital file, web-based electronic forms. If a manual operation is necessary for the RE to transfer the data from the form to the NVR tool, then typing errors might be unintentionally introduced.
	Action	sNVR will implement a web-based multilingual form in conformity with the Standard Form For Registration in Appendix 4 to the NVR Decision.
30	**Implement a Reference File for the organizations identified in the registers.**	
	Situation	The organizations data (organization name, full address, registered business number, email) is currently kept in each register separately (all the NVRs, VKMR, ERATV, ERADIS); a reliable unique identifier of organizations in the whole system of vehicle-related register does not exist and a reference file of organizations in not in place. The situation is source of inconsistencies; administrative overhead; difficulty to aggregate complementary data out of the vehicle-related registers.
	Action	An Organization Reference File for the identification and contact data of the organizations identified in the registers will be setup by the Agency. The Organization Code definition will be included in the amended NVR Decision. Each organization will be assigned by the Agency a unique 4-positions alphanumeric Organization Code. The range 0001 to 9999 will be reserved for organisations in the scope of TAF and TAP TSI.

ID	Action title	Description
31	**Implement an access point to the vehicle-related registers.**	
	Situation	Although the vehicle-related registers are implemented by separate IT tools, they keep some complementary or correlated data. Therefore, a user may need to access several registers via the respective web interfaces to retrieve all relevant information concerning a vehicle.
	Action	A unique web-based access point application will be implemented and will enable the users of vehicle-related registers to run predefined kinds of enquiries in a few clicks: the entry point application will manage the communication to each register (via web-services), aggregate the data and return the result of the enquiry to the user.
32	**Define a standard file for the exchange of additional authorisations. Modify sNVR to support the export to/import from the standard exchange file.**	
	Situation	Additional authorisations shall be registered, at the request of the RH, in the NVR of the Member State where the vehicle was firstly authorised and registered. To that end the RH should use and submit to the relevant RE a Multilingual Form.
	Action	A standard file for the exchange of additional authorisations is defined. The sNVRs will be updated to export to/import from such file.
33	**Define a standard template for the confirmation of registration document**	
	Situation	Following a new registration in the NVR or an update an existing registration, the RE may return to the applicant (RH) a document confirming the fulfilment of the request. The confirmation of registration document should follow the structure of the Standard Form in Appendix 4 to the NVR Decision. However, to that end, some complementary information to the form.
	Action	The date of update is added to the Standard Form. sNVR will be upgraded to be able to generate such confirmation of registration document in all EU languages.
36	**Implement automatic email notifications of changes to all actors concerned by the change**	
	Situation	The vehicle-related registers do not implement or partly implement automatic email notifications of changes to the data recorded therein to all organizations that are concerned by the change.
	Action	Email notifications will be implemented or improved in ERATV and ECMCR (ERADIS), VKMR tool (if IT tool is implemented). The NVR case is treated in action 5.

6.4. Changes to Specifications

6.4.1. Changes to NVR Specification

This chapter describes the main proposed changes agreed by the RVRR WP to the NVR Specification as set out in [L4] Decision 2007/756/EC. More details can be found in Annex 6 Rationalisation Actions Forms.

6.4.1.1. Changes to NVR dataset

6.4.1.1.1. Format of dates and country codes

All parameters of type date are to be expressed in ISO 8601 format YYYYMMDD.

All Country Codes are to be expressed according to the EU Interinstitutional style guide (see http://publications.europa.eu/code/en/en-370100.htm: two-letter ISO code should be used (ISO 3166 alpha-2), except for Greece and the United Kingdom, for which the abbreviations EL and UK are recommended. In case of the multinational safety authority Channel Tunnel Intergovernmental Commission, the country code CT is to be used. In case of the Agency, the country code EU is to be used.

6.4.1.1.2. 2.3 Member State of authorising NSA (new field)

A new field [2.3 Member State of authorising NSA] is added to provide for the input of the Member State that issued an authorisations to the vehicle. The field complements the information in field [2.2.Name of NSA].

Parameter index	Parameter name	Format	Applicability
2.3	**Member State of authorising NSA**	**2-letter code**	**Compulsory**

6.4.1.1.3. 3bis. Manufacturer serial number (new field)

The information on the manufacturer serial number may be optionally specified in the new field [3bis. Manufacturer serial number].

Parameter index	Parameter name	Format	Applicability
3bis.	**Manufacturer serial number**	**Text**	**Optional**

6.4.1.1.4. 4. EC Reference (modified field)

The field is modified to provide for the input of up to two references for the EC Declaration of Verification (separately for rolling stock subsystem and on-board CCS subsystem) and the corresponding issuing bodies.

Parameter index	Parameter name	Format	Applicability
4.	EC reference**s**		Compulsory (when available)

The format of the reference to EC Declarations of Verifications, the EIN format is to be used. Until an EIN format for EC Declarations is not defined, the current format provided for in Communication Protocol may be used.

Parameter index	Parameter name	Format	Applicability
4.9	EC reference	~~Text~~ **For existing vehicles: text For new vehicles: alphanumeric code based on EIN, see Appendix 2.**	Compulsory (when available)

6.4.1.1.5. Email addresses for the organisations identified in the registration (new fields)

New fields are added to provide for the input of the email addresses for the organisations identified in the registration. The email address for the ECM is already in the NVR dataset.

Parameter index	Parameter name	Format	Applicability
4.9	**(EC Declaration of Verification Issuing Body) Email**	**email address**	Compulsory (when available)
7.7	**(Owner) Email**	**email address**	Compulsory
8.8	**(Keeper) Email**	**email address**	Compulsory

6.4.1.1.6. Organisation Codes for the organisations identified in the registration (new fields)

New fields are added to provide for the input of the Organisation Codes for the organisations identified in the registration.

Parameter index	Parameter name	Format	Applicability
4.10	**(EC Declaration of Verification Issuing Body) Organisation code**	**Alphanumeric code**	Compulsory (when available)
7.8	**(Owner) Organisation code**	**Alphanumeric code**	Compulsory
8.9	**(Keeper) Organisation code**	**Alphanumeric code**	Compulsory
9.8	**ECM Organisation code**	**Alphanumeric code**	Compulsory

6.4.1.1.7. 11. Member States where the vehicle is authorised (modified field)

The field [11. Member States where the vehicle is authorised] will be filled automatically by the NVR tool and will contain a list of Member States with the respective authorisation status and date, i.e. the date of suspension (new field 13.4), the date of revoke (new field 13.5) , the date of expiration (field 13.2).

Parameter index	Parameter name	Format	Applicability

11	Member State ~~numeric code as defined in Annex P.4 to OPE TSI~~ **(authorisation status + date)**	List **of 2-letter codes Possible options for authorisation status: Active, Suspended, Revoked, Expired**.	Compulsory

6.4.1.1.8. 10.3 Withdrawal reason (new field)

A new field [10.3 Withdrawal reason] is added to provide for the input of the withdrawal reason in case a generic withdrawal code (10, 20 or 30) is used.

Parameter index	Parameter name	Format	Applicability
10.3	**Withdrawal reason**	**Text**	**Compulsory (when applicable)**

6.4.1.1.9. 11bis Additional conditions applicable to the vehicle (new field)

A new field [11bis Additional conditions applicable to the vehicle] is added to provide for the input of the information on RIC, RIV, TEN, TEN-CW, TEN-GE or other bilateral or multilateral agreements. Such information is currently stored in parameter 11 together with the list of Member States where the vehicle is authorised.

Parameter index	Parameter name	Format	Applicability
11 bis	**Additional conditions applicable to the vehicle**	**Text**	Compulsory (when applicable)

6.4.1.1.10. 13.4 Date of suspension (new field)

A new field [13.4 Date of suspension] is added to provide for the input of date of suspension of the authorisation (in case of suspension).

Parameter index	Parameter name	Format	Applicability
13.4	**Date of suspension (if applicable)**	**Date (YYYYMMDD)**	Compulsory (when applicable)

6.4.1.1.11. 13.5 Date of revoke (new field)

A new field [13.5 Date of revoke] is added to provide for the input of date of revoke of the authorisation (in case of revoke).

Parameter index	Parameter name	Format	Applicability

13.5	**Date of revoke (if applicable)**	**Date (YYYYMMDD)**	Compulsory (when applicable)

6.4.1.2. Changes to NVR operating mode

6.4.1.2.1. Deadline of 20 working days for the completion of the registration process

A maximum timeframe of 20 working days is set for the completion of the registration in the NVR after the receipt of a complete application file.

The RE shall register the changes in the NVR within 20 working days from the receipt of a complete application file.

6.4.1.2.2. The Registration Holder is the keeper

It is clarified that the registration holder is the registered keeper.

The keeper of the vehicle is the "registration holder" in the meaning of Article 33(3) of Directive 2008/57/EC

6.4.1.2.3. Procedure of change of ECM

The procedure for the change of ECM specified in the ECM Regulation for ECMs of freight wagons is extended to all kinds of vehicles.

Should an ECM change, the procedure specified in article 5(8) of Regulation 445/2011 shall be followed whatever the kind of vehicle concerned.

6.4.1.2.4. No additional registration of vehicles from OTIF NVRs connected NVRs

Vehicles coming from third countries and already registered in an NVR in line with the NVR Specifications and connected to ECVVR (namely the NVRs of non-EU OTIF Contracting States connected to ECVVR) do not need to be additionally registered in the NVR of the first EU Member States where they enter the EU railway network.

In case of vehicles entering the European Union rail network from third countries and registered in an NVR not in line with this Specification or not connected to ECVVR, they shall be registered only in the NVR of the first Member State that authorised the vehicle to be placed in service on the European Union rail network.

6.4.1.2.5. Possibility to transfer the registration to another NVR.

The registration of a vehicle may be transferred to a new NVR, provided that the vehicle is authorised in the receiving Member State and that the corresponding NVR is connected to ECVVR. The transfer of registration requires necessarily a change of EVN, because according to the EVN specification, digits 3 and 4 indicate the Member State of registration.

The EVN may be changed at the request of the keeper through a new registration of the vehicle in the NVR of a different Member State connected to ECVVR and subsequent withdrawal of the old registration. Such change of EVN is without prejudice to the application of Articles 21 to 26 of

Directive 2008/57/EC as far as the authorisation procedures are concerned. The administrative costs incurred to change the EVN shall be covered by the keeper requesting the change of EVN. This provision is applicable until the European Vehicle Register referred to in Article 47(5) of Directive (EU) 2016/797 is operational.

6.4.1.2.6. Automatic email notification of changes

The NVRs shall implement automatic email notification of changes to the keeper and concerned NSAs.

Following a change to one or more registration items, the IT system shall send to the keeper and to the NSAs of the Member States where the vehicle is authorised an automatic e-mail notification informing about the change.

Following a change of keeper or owner or ECM, the IT system shall send an automatic e-mail notification to respectively the previous keeper and the new keeper or the previous owner and the new owner or the previous ECM a new ECM.

A keeper or owner or ECM may opt-in the reception of automatic e-mail notifications informing about changes to registrations they are identified within.

To that end, the keeper or owner or ECM shall submit a request to the RE of the Member State where the vehicle is registered. The administrative costs incurred to record the notification settings in the IT system shall be borne by the entity submitting the request.

6.4.1.2.7. Mandatory organisation codes allocated by the Agency

Each organisation accessing an NVR or identified therein shall be assigned an Organisation Code by the Agency. The Organisation Codes are composed of 4 alphanumerical characters.

Any organisation accessing an NVR or identified therein shall be assigned an organisation code.

Codes in the range 0001 to 9999 are reserved to organisations in the scope of TAF and TAP TSI

An organisation code in the range 0001 to 9999 shall be allocated only to companies under scope of TAP and TAF TSI.

6.4.1.2.8. Restriction codes published on the Agency website

The table of restriction codes is moved from the NVR Decision to a technical document published on the Agency website. The same list applies for both NVR and ERATV.

The list of harmonised restriction codes for the whole of the Union rail system shall be kept up-to-date by the Agency and published on its web site.

6.4.1.2.9. EIN Specification published on the Agency website

The EIN Specification and the codes for the type of documents concerned are moved from the NVR Decision to a technical document published on the Agency website.

The definition of the structure and content of the EIN (European Identification Number), including the codification of the types of documents concerned, is kept in a technical document maintained by the Agency and published on the Agency's web site.

6.4.1.2.10. RUs/IMs allowed to search list of EVNs

The access rights of RUs and IMs are changed from consultation of data for a single EVN per search to consultation of data for a list of EVNs.

All data based on one or more vehicle numbers.

6.4.1.3. Transition

6.4.1.3.1. Update of ECCVR tools in line with the amended NVR Specification

The ECVVR tools shall be adapted within two years two years from the entry into force of the amended NVR Decision.

The European Railway Agency shall adapt the installation files and documents to be used for setting up the standard national vehicle register (sNVR), the translation engine and the virtual vehicle register according to the Annex to this Decision within one year from the entry into force of this Decision.

Member States shall adapt their national vehicle register according to the Annex to this Decision within one two years from the entry into force of this Decision.

6.4.1.3.2. Filling data for existing registrations

For existing registrations, i.e. registrations carried out before the entry into force of the amended NVR Decision, the data for fields 2.3, 4.10, 7.7, 7.8, 8.8, 8.9, 9.8, 11bis shall be filled within two years from the entry into force of the amended NVR Decision.

The concerned fields are the organisation codes of all organisations (4.10, 7.8, 8.9, 9.8), the emails of keeper and owner (7.7, 8.8), the Member State that issued of the authorisation (2.3), and the additional conditions applicable to the vehicle (11 bis).

Member States shall ensure that, for the vehicles registered before the entry into force of this Decision, data for fields 2.3, 4.10, 7.7, 7.8, 8.8, 8.9, 9.8, 11bis are recorded within two years from the entry into force of this Decision.

The following considerations support the choice:

- Fields [7.7 (Owner) email] and [8.8 (Keeper) email]: Owner and Keeper are operational actors of the registration and already recorded for in existing registrations; they are also recipient of the automatic email notifications.
- Fields 4.10, 7.8, 8.9, 9.8 (Organisation codes): EC Declaration of verification Issuing Body, Owner, Keeper, ECM are already recorded in NVR for existing registrations. Taking into account that the same organisation may be linked to several registrations (with possibly different roles in each of

them), the effort to complement the organisation data with Organisation Codes appears acceptable, compared to the expected benefits on the consistency of data and usability of ECVVR. A precondition for this task is that the Organisation Reference File is set up by the Agency.

- Field [2.3 Member State of authorising NSA): for each authorisation, data can be filled starting from field [2.3 Name of authorising NSA].
- Field [11bis Additional Conditions applicable to the vehicle]: for each registration data can be migrated from field [11 Member State where the vehicle is authorised] where it is currently recorded together with the list of Member States where the vehicle is authorised.

Data for the remaining new mandatory fields may be filled voluntarily for existing registrations.

The following WP Members did not agree with the proposed approach

- NSA DE: they support that new mandatory fields are filled only for new registrations.
- NSA LU: because of the significant effort for the NSA (in its role of registration entity) for requesting the data and updating NVR.
- NSA PL: because it will results in fees to be paid by keepers for the update of the old registrations. They support that data for the new mandatory fields are instead supplied with the first application for change after the entry into force of the amended NVR Decision.

6.4.2. Changes to ERATV Specification

This chapter describes the main proposed changes agreed by the RVRR WP to the ERATV Specification as set out in [L5] Decision 2011/665/EU. More details can be found in Annex 6 Rationalisation Actions Forms.

These changes will be incorporated in the next revision cycle of the ERATV Specification.

6.4.2.1. Changes to ERATV dataset

New fields are added to provide for the input of the Organisation Codes (and the contact data) for the organisations identified in the record, namely the Manufacturer and the Type Authorisation Holder.

Parameter		**Format**	**Applicability**			
			1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles
3.1.3.1.2.1.3	**AH Organization code**	**Alphanumeric code**	**Y**	**Y**	**Y**	**Y**

Parameter	**Format**	**Applicability**

			1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles
1.3.1.3	**Manufacturer Organization code**	**Alphanumeric code**	**O**	**O**	**O**	**O**

6.4.2.2. Changes to ERATV operating mode

None.

6.4.3. Changes to ECMCR Specification

This chapter describes the main changes agreed by the RVRR WP to the ECMCR Specification as set out in [D15] Communication Protocol. More details can be found in Annex 6 Rationalisation Actions Forms.

6.4.3.1. Changes to ECMCR dataset

A new field is added to provide for the input of the ECM's Organisation Code.

6.4.3.2. Changes to ECMCR operating mode

Deadline for publication

The maximum timeframe for the publication by the Agency shall be 20 working days from the receipt of a complete electronic form.

Validation of data by the Agency

The Agency before publication shall carry out a validation regarding the compliance with the format of the data specified in Annex V of the ECM Regulation and the consistency with the reference data in ERADIS.

6.4.4. Changes to VKMR Specification

This chapter describes the main changes agreed by the RVRR WP to the ECMCR Specification as set out in [D14] VKM Application Guide. More details can be found in Annex 6 Rationalisation Actions Forms.

6.4.4.1. Changes to VKMR dataset

A new field is added to provide for the input of the keeper's Organisation Code.

6.4.4.2. Changes to VKMR operating mode

Deadline for publication

If an IT tool for VKMR is available, a maximum timeframe of 20 working days should be allocated to the Agency to publish the VKMs after the receipt of a complete application file.

Validation of data by the Agency

The Agency shall carry out a validation regarding the compliance with the format of data specified in Annex 1 to the VKM Application Guide and the consistency with the reference data in VKMR.

6.5. Responsibilities/accountabilities for the data input/update

Changes respect the AS-IS situation are shown in **bold-underline** in table below.

Responsibility/accountability for the data input/update – TO BE			
Register	**Responsible**	**Accountable**	**Actors to be notified of changes**
NVR	~~RH~~ **Keeper** (immediately[1]) RE **(by max 20 wdays)**	**RH** **RE**	**Notifications are delivered by email.** **All changes: Keeper, concerned NSAs, other organizations identified in the registration if they OPT-ed in the notifications.** **Change of Owner/Keeper/ECM:New and previous Owner/new and previous Keeper/new and previous ECM** **Withdrawal: the entity requesting the withdrawal.**
ERATV	NSA (by max 20 wdays from decision [2]) Agency (validation against specification and publication by max 20 wdays[2])	**NSA**	Authorising NSAs
ECMCR	Certification Body (by 1 week from decision[3]) Agency (**validation against specification and**	**Certification Body**	

	publication[3] **by max 20 wdays**)		
VKMR	Applicant (Keeper)[5] NSA (validation against Appendix 6, Part 1 of NVR Decision[4]) Agency (**validation against specification,** check uniqueness of VKM and publication **by max 20 wdays**)	**Keeper**	
1. Interoperability Directive 2. ERATV Decision 3. ECM Regulation 4. VKM Application Guide 5. NVR Decision			
In **bold-underline**, the changes compared to the AS-IS situation			

6.6. Impact on Interfaces

6.6.1. RINF

The interface between ERATV and RINF is not affected by the envisaged rationalisation actions. In other words there is no change in ERATV to:

- The interfaces parameters with RINF
- The availability of the ERATV register

The table of correspondences of parameters in ERATV and RINF is maintained in the ERATV Application Guide.

Web-services are available in ERATV for the machine-to-machine consultation of data. In the context of the implementation of web-services for the vehicle-related registers, a validation of the ERATV

web services will take place to verify the consistency of data definitions (e.g. for each data element: name, xml name, definition, format, content) with the other vehicle-related registers and RINF.

Web-services implemented in ERATV and RINF enable the possibility for users to use the data for a variety of purposes, including the vehicle-infrastructure technical compatibility check, however the limitation below must be noted:

- Considering the non-operational purpose (see chapter 4 Expected use of vehicle-related registers) of the vehicle-related registers – including ERATV – data in ERATV may be suitable for checking technical compatibility in the planning phase only.
- ERATV does not currently contain technical data for *existing vehicles*, i.e. vehicles that were placed in service before the entry into force of the Interoperability Directive 2008/57/EC.

6.6.2. PRM TSI Inventory of Assets

PRM TSI parameters related to vehicles are kept in the ERATV. PRM TSI parameters related to the infrastructure are kept in the Inventory of assets. No impact on the PRM TSI parameters in ERATV is generated by the envisaged rationalisation actions.

6.6.3. TAF TSI RSRDs

There is a partial overlap of parameters in the vehicle-related registers and the TAF TSI RSRD kept by each keeper.

In order to ensure the synchronization of the overlapping data, keepers may retrieve reference data from the vehicle-related registers by means of a published interface (e.g. via web services) and use it as read-only data in RSRD. An alternative way to ensure the synchronization, is the setup of control procedures by the keepers.

The rationalisation does not introduce new technical parameters in ERATV, therefore no impact is envisaged on the technical part of the TAF TSI data catalogue. On the other hand, a few additional parameters are added to NVR; the corresponding parameters in the administrative part of the TAF TSI data catalogue is shown below:

NVR Specification proposal		**TAF TSI data catalogue**	
Parameter name	**Parameter Format**	**Parameter name**	**Parameter Format**
Manufacturer serial number	Text	Not used	
Keeper/Owner/ECM/EC Decl Issuing Body E-mail address	E-mail		

Keeper/Owner/ECM/EC Decl Issuing Body Organization Code	4 alphanumeric characters	Company Code	Number, 4 digits
Withdrawal (of registration) reason.	Text	Not used	
Additional conditions applicable to the vehicle	Text RIV, RIC, TEN, TEN-GE, TEN-CW	InteropCapability	Numeric 01 = National 02 = Bi-/Multilateral (with agreement or authorisation grid) 03 = RIV 05 = TEN 06 = TEN-GE 07 = TEN-CW 08 = TEN RIV
Member State of authorising NSA	2-letter code according to Interistitutonal Style Guide	MulitlateralAuthorisationCountries	ISO
Date of suspension (of authorisation)	Date (YYYYMMDD)	DateSuspensionOfAuthorisation	Date
Date of revoke (of authorisation)	Date (YYYYMMDD)	Not used	

6.7. Impact on model of vehicle-related data

The picture below describes the high-level model of data in the rationalised system of vehicle-related registers.

The AS-IS model is simplified by means of the introduction a shared repository (Organization's Reference File) for the data organizations. To that end, the following definition applies.

Organisation: any organization that in conformity with the relevant legal provisions is identified in the register and/or submits data to the register and/or consults data in the register.

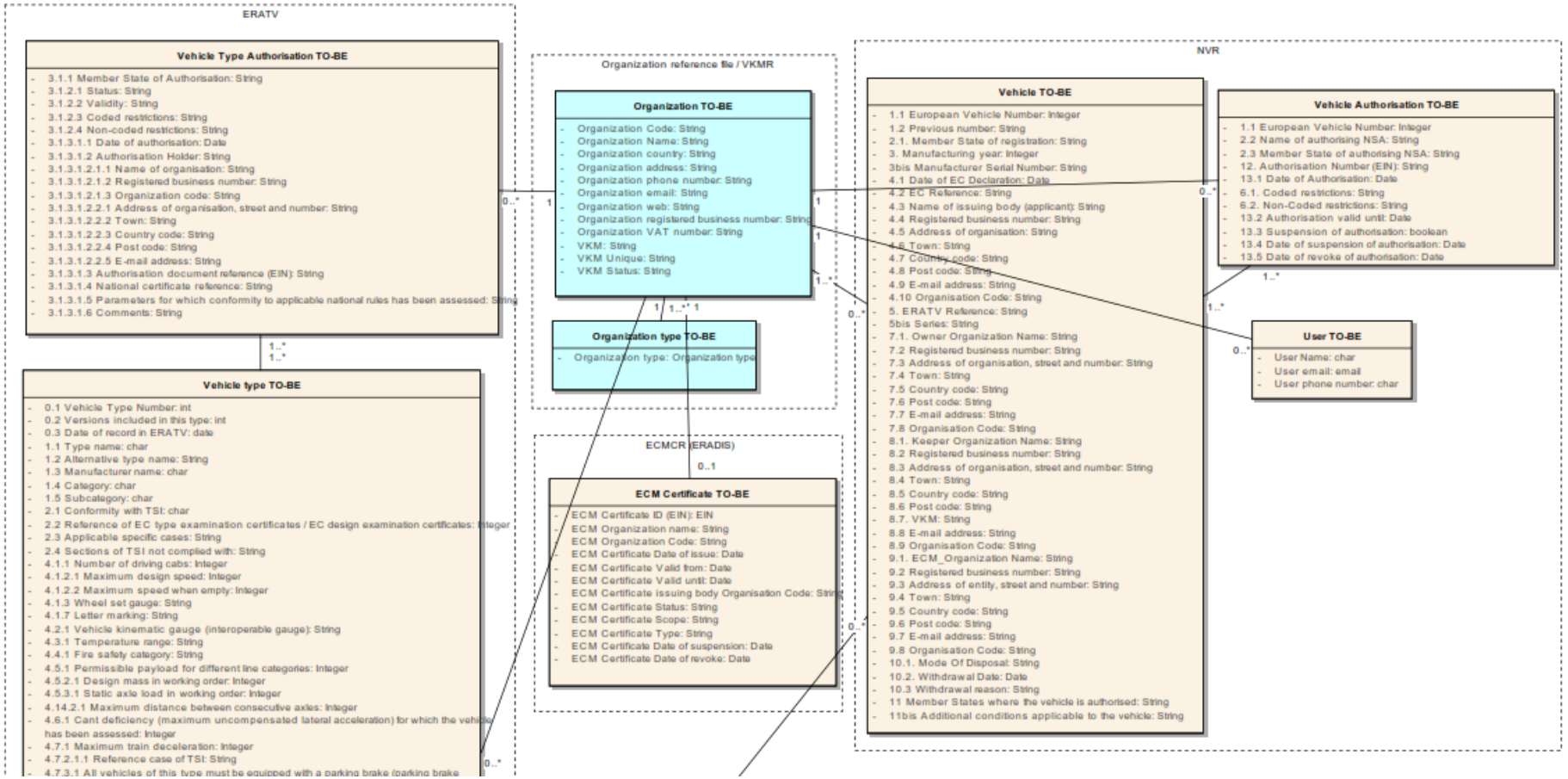


Figure 4: High-level model of data for the rationalised vehicle-related registers

6.8. Impact on Business Use Cases

The impact on the business use cases is described in each action form (see Annex 6 Rationalisation Actions Forms). Some new use cases, marked in the table in **bold-underline**, are supported by the rationalised system of vehicle-related registers.

Table 6: Business use cases – Impact of Rationalisation

Use Case Name
02 Register Authorisation in NVR
02.1 Reserve/Assign an EVN
02.2 Register First Authorisation in the NVR
02.3 Register Additional Authorisation in the NVR
02.4 Register in NVR a Vehicle Coming from a third country.
02.5 Re-registration with a new EVN following technical changes
02.6 Issue registration document
03 Modify registration in NVR
03.1 Modify registration in NVR - non-authorisation part
03.1.1 Modify Keeper in NVR
03.1.2 Modify ECM in NVR
03.1.3 Modify Owner in NVR
03.1.4 Schedule a change of Keeper/Owner/ECM
03.2 Modify registration in NVR - authorisation part
03.2.1 Modify registration in NVR - authorisation part - authorisation data
03.2.2 Modify registration in NVR - authorisation part - authorisation status
03.2.2.1 Suspend/reactivate Authorisation
03.2.2.2 Revoke Authorisation
03.3 Withdraw registration in NVR
03.3.1 Suspend/reactivate registration in NVR
04 Record a type authorisation in ERATV
04.1 Reserve/Assign a vehicle type ID
04.2 Record a first type authorisation in ERATV
04.3 Record an additional type authorisation in ERATV
05 Modify type authorisation record in ERATV
05.1.Correct error in type technical data in ERATV
05.2 Modify type technical data in ERATV after the issue of an additional type authorisation or a modification of a type authorisation
05.3 Modify type authorisation data in ERATV
05.4 Modify Type authorisation status in ERATV

Use Case Name
05.4.1 Withdraw type authorisation in ERATV
05.4.2 Suspend/reactivate type authorisation in ERATV
06 Record data in the VKMR
06.1 Register a new VKM (get a VKM code) in VKMR
06.2 Modify a VKM record in VKMR
07 Record data in ECMCR (ERADIS)
07.1 Register ECM Certificate in ECMCR (ERADIS)
07.2 Modify ECM Certificate in ECMCR (ERADIS)
07.2.1 Modify ECM Certificate status in ECMCR (ERADIS)
07.2.1.1 Suspend/reactivate ECM Certificate in ECMCR (ERADIS)
07.2.1.2 Revoke ECM Certificate in ECMCR (ERADIS)
07.2.2 Modify ECM Certificate data in ECMCR (ERADIS)
08 Consult vehicle registration in NVR
08.1 Consult registration data in NVR
08.1.1 Identify keeper
08.1.2 Identify ECM
08.1.3 Identify Owner
08.2 Consult Registration Status in NVR
08.3 Consult Authorisation data in NVR
08.3.1 Consult in NVR the authorizations granted by another MS
08.3.2 Consult Restrictions in NVR
08.3.3 Consult authorisation status in NVR
08.4 Consult vehicle registration in NVR for investigation/ supervision/ audit
09 Search vehicles in NVR
09.1 Search vehicles associated in NVR to a given ECM
09.2 Search vehicles by Vehicle Type ID in NVR
09.3 Run reports in NVR
09.4 Search vehicles by Manufacturer Serial Number in NVR
09.5 Search vehicles by date of suspension (of authorisation) in NVR
09.6 Search vehicles by date of revoke (of authorisation) in NVR
09.7 Search for a list of EVNs in NVR
10 Consult type record in ERATV
10.1 Consult type authorisation data in ERATV
10.1.1 Consult type restrictions in ERATV
10.2 Consult type technical data in ERATV
10.3 Consult type authorisation status in ERATV
10.4 Check compatibility vehicle/infrastructure
10.4 Consult type record in ERATV via web-services

Use Case Name
10.4.1 Check compatibility vehicle/infrastructure for planning
11 Consult ECM Certificate in ECMCR (ERADIS)
11.1 Consult ECM Certificate status in ECMCR (ERADIS)
11.2 Consult ECM Certificate data in ECMCR (ERADIS)
11.2.1 Consult Scope of ECM Certificate in ECMCR (ERADIS)
12 Search types in ERATV
12.1 Search vehicle types by any of the ERATV parameters
12.2 Search types in ERATV via web-services
13 Search ECM Certificates in ECMCR (ERADIS)
13.1 Run report in ECMCR (ERADIS)
14 Search vehicles in VVR
14.1 Search vehicles by Vehicle Type ID in VVR
14.1.1 Run data quality report in VVR
14.1.2 Run report in VVR aggregating data from other registers
14.2 Search vehicles in VVR via web-services
14.3 Run reports in VVR
14.4 Search vehicles by Manufacturer Serial Number in VVR
14.5 Search vehicles by date of suspension (of authorisation) in VVR
14.6 Search vehicles by date of revoke (of authorisation) in VVR
14.7 Search for a list of EVNs in VVR
14.8 Select language of VVR web-interface
15 Authorise type of vehicle
15.1 Authorise type (first or renewed)
15.2 Authorise type (additional)
15.3 Modify type authorisation
16 Search VKM codes in VKMR
17 Consult VKM data in VKMR
18 Issue ECM Certificate
19 Consult vehicle registration in VVR
19.1 Consult ECM Certificate data in VVR
19.2 Consult vehicle registration in VVR via web-services
20 Issue Registration Fees
22 Grant Access to NVR
23 Grant access to VVR
24 Send Email Notifications from NVR
25 Send Email Notifications from ERATV
26 Send Email Notifications from ECMCR (ERADIS)
26.1 Notify change of status of ECM Certificate in ECMCR (ERADIS)

Use Case Name
27 Send Email Notifications from VKMR
28 Search data via the Access Point application
30 Record data in the Reference File
30.1 Register new organization in the Reference File
30.2 Modify organization data in the Reference File
31 Consult data in the Reference File
31.1 Consult data in the Reference File

7. Conclusions

The rationalisation of the vehicle-related registers described in this report requires the amendment of the NVR specification, in line with the rationalisation actions proposed in the Do Medium scenario. However, some actions of strictly technical nature have no impact on the NVR specification and may be implemented independently from the adoption of the amended NVR specification. The rationalisation has very limited impact on the ERATV specification; therefore no immediate amendment is proposed; these requirement will be incorporated in the next revision cycle of the ERATV specification.

It is estimated that the timeframe for the implementation of the rationalisation is of maximum **four years** from the publication of the amended NVR specification in the Official Journal of the European Union.

Annex 1: Definitions and abbreviations

[A1].1. Definitions

Table 7: Table of definitions

Definition	Description
Agency	The European Railway Agency
Authorisation holder	Entity that applied for and received the authorisation of type of vehicle (section 6 of Annex I of the ERATV Decision).
Availability	The property that data, information, and information and communications systems are accessible and usable on a timely basis in the required manner.
Entity in charge of maintenance	"An entity in charge of maintenance of a vehicle, and registered as such in the national vehicle register" (Article 2(z) of the Interoperability Directive and Article 3(t) of the Safety Directive). The responsibilities of an entity in charge of maintenance are defined in Article 14a of the Safety Directive.
Manufacturer	Any natural or legal person who manufacturers a vehicle or has a vehicle designed or manufactured, and markets that vehicle under his name or trademark. The indication of manufacturer in ERATV is for reference only; it is without prejudice to the intellectual property rights, contractual responsibilities or civil liability (section 6 of Annex I of the ERATV Decision).
Registration Holder	Entity responsible for immediately declaring any modification to the data entered in the National Vehicle Register, the destruction of a vehicle or its decision to no longer register a vehicle, to the authority [Registration Entity] of any Member State where the vehicle has been authorised as set out in Article 33(3) of Directive 2008/57/EC. Unless otherwise specified in the registration documents, the keeper of the vehicle is considered to be the 'registration holder' (section 3.2.3 of Annex to the NVR Decision).
Reliability	The ability to be relied on or depended on.
Trustability	Confidence in the truth of the information.
Type	Vehicle type as defined in Article 2(w) of Directive 2008/57/EC. Type must reflect the unit that has been subject of the conformity assessment and authorisation. This unit may be a single vehicle, a rake of vehicles or a trainset (section 6 of Annex I of the ERATV Decision).
Up-to-dateness	The condition of being up-to-date.
Vehicle	Railway vehicle as defined in Article 2(c) of Directive 2008/57/EC.

[A1].2. Abbreviations

Table 8: Table of Abbreviations

Abbreviation	Meaning
ALE	Autonomous Train Drivers' Unions of Europe
CBA	Cost Benefit Analysis
CER	Community of European Railway and Infrastructure Companies
EC	European Commission
ECM	Entity In Charge of Maintenance
ECMCR	Register of ECM Certificates
EIM	European Rail Infrastructure Managers
EPTTOLA	European Passenger Train and Traction Operating Lessors' Association
ERADIS	European Railway Agency Database of Interoperability and Safety
ERATV	European Register of Authorised Types of Vehicles
ERFA	European Rail Freight Association
EU	European Union
IM	Infrastructure Manager
NSA	National Safety Authority
NVR	National Vehicle Register
OTIF	Intergovernmental Organisation for International Carriage by Rail
PRM	Persons with Reduced Mobility
RB	Representative Body
RE	Registration Entity
RH	Registration Holder
RINF	Register of Infrastructure
RISC	Railway Interoperability and Safety Committee
RSRD	Rolling Stock Reference Database
RSRD^2	Rolling Stock Reference Database software solution implemented by UIP
RU	Railway Undertaking
RVRR	Rationalisation of Vehicle-related registers
SCCR	Study on Coherence and Consistency of Registers
ToR	Terms of Reference
UIP	International Union of Wagon Keepers

Abbreviation	Meaning
UIRR	International Union of Combined Road-Rail Transport Companies
UITP	International Association of Public Transport
VKM	Vehicle Keeper Marking
VKMR	Vehicle Keeper Marking Register
WP	Working Party

Annex 2: Reference documents

Table 9: Table of Reference Documents

[N°]	Title	Reference	Version
[D1]	Agency Work program 2013	Decision 79/2012 of ERA Administrative Board	-
[D2]	Agency Work program 2014	Decision 91/2013 of ERA Administrative Board	-
[D3]	Agency Work program 2015	Decision 118/2014 of the Administrative Board	
[D4]	Agency Programming Document 2016	Decision 119/2015 of the Administrative Board	Amended by Decision n°127/2016 and Decision n°138/2016
[D5]	Approved Terms of Reference (ToR)	ERA-REC-102-ToR	1.0
[D6]	EU Rail Vehicle & Infrastructure Databases Study	-	Final report
[D7]	Study on Coherence and Consistency of Registers (SCCR)	ERA/REP/15-2012	1.1
[D8]	Administrative Arrangements between OTIF, ERA and DG-Move	24/10/2013	
[D9]	EC study "EU Rail Vehicle & Infrastructure Databases Study"	-	Final report
[D10]	Study on Coherence and Consistency of Registers (SCCR)	ERA/REP/15-2012	1.1
[D11]	RVRR Inception Report	ERA-REC-102-REP	1.0
[D12]	ECVVR Application Guide	ERA/GUI/01-2010/INT	4.0
[D13]	ERATV Application Guide	ERA/GUI/01-2012/INT	1.0
[D14]	VKM Application Guide	U-VKM-061128	1.2
[D15]	(ERADIS) Communication Protocol	ERA-20070524	2.0

[N°]	Title	Reference	Version
[D16]	(ERADIS) Practical Arrangements for transmitting interoperability documents	ERA/INF/10-2009/INT	0.1
[D17]	Codification of restrictions in ERATV and ECVVR	ERA/TD/2011-09/INT	1.01
[D18]	DV29 bis		

Annex 3: Reference legislation

Table 10: Table of Reference Legislation

[N°]	Title	Reference	Version
[L1]	Regulation (EC) No 881/2004 of the European Parliament and of the Council of 29 April 2004 establishing a European Railway Agency (Agency Regulation)	OJ L 220, 21.6.2004	As last amended by Regulation (EC) No 1335/2008 of the European Parliament and of the Council (OJ L 354, 31.12.2008)
[L2]	Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the rail system within the Community (Interoperability Directive)	OJ L 191, 18.7.2008	As last amended by Directive 2009/131/EC (OJ L 273, 17.10.2009) Directive 2011/18/EU (OJ L 57, 2.3.2011) Directive 2013/9/EU (OJ L 68, 12.3.2013)
[L3]	Directive 2004/49/EC on safety on the Community's railways and amending Council Directive 95/18/EC on the licensing of railway undertakings and Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification (Railway Safety Directive)	OJ L 164, 30.4.2004	As last amended by Directive 2009/149/EC (OJ L 313, 28.11.2009)
[L4]	Decision 2007/756/EC (NVR Decision)	OJ L 305,	As last amended

[N°]	Title	Reference	Version
		23.11.2007	by Commission Decision 2011/107/EU of 10 February 2011 (OJ L 43, 17.2.2011) Decision 2012/757/EU of 14 November 2012 (OJ L 345, 15.12.2012) (This amendment shall apply from 1 January 2014)
[L5]	Decision 2011/665/EU (ERATV Decision)	OJ L 264, 8.10.2011	-
[L6]	Regulation (EU) 445/2011 (ECM Regulation)	OJ L 122, 11.05.2011	-
[L7]	Decision 2012/757/EU (OPE TSI)	OJ L 345, 15.12.2012	Commission Decision 2013/710/EU: of 2 December 2013 (OJ L 323, 4.12.2013)
[L8]	Commission Recommendation 2011/217/EU (DV29)	OJ L 95, 8.4.2011	
[L9]	Commission Regulation (EC) No 62/2006 (TAF TSI)	OJ L 13, 18.1.2006	Commission Regulation (EU) No 328/2012 of 17 April 2012 (OJ L 106, 18.4.2012), Commission Regulation (EU) No 280/2013 of 22 March 2013 (OJ L 84, 23.3.2013)

[N°]	Title	Reference	Version
[L10]	Commission Regulation (EU) No 454/2011 (TAP TSI)	OJ L 123, 12.5.2011	
[L11]	Commission Decision 2010/713/EU on modules for the procedures for assessment of conformity, suitability for use and EC verification to be used in the technical specifications for interoperability adopted under Directive 2008/57/EC of the European Parliament and of the Council	OJ L 319, 4.12.2010	
[L12]	Commission Regulation (EU) No 201/2011 of 1 March 2011 on the model of declaration of conformity to an authorised type of railway vehicle	OJ L 57, 2.3.2011	

Annex 4: Terms of reference

TERMS OF REFERENCE

ERA-REC-102-REP-TOR V1.0

FOR

Rationalisation of Vehicle-related registers (RVRR)

Project details

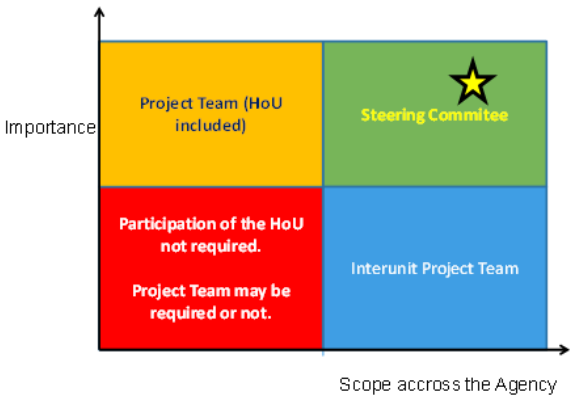
Project name	Recommendation for rationalisation of vehicle-related registers
Project code	ERA-REC-nn-2013
Activity Based Item	9.4 of WP 2013
Unit / Sector	Interoperability Unit / Coordination Sector
Project manager	Massimo Bellino
External resources needed	Not applicable

Project description **(brief description; detailed description will be included in the Project Plan)**

Background	Registers in place: • NVR established by Article 33 of the Interoperability Directive 2008/57/EC and by NVR Decision 2007/756/EC • ERATV established by Article 34 of the Interoperability Directive 2008/57/EC and by ERATV Decision 2011/665/EU • VKMR kept by ERA in accordance to Article 19 of the Agency Regulation 881/2004 and to Appendix P of OPE TSI. • Register of certified ECMs established by Article 10 of ECM Regulation 445/2011 - The Study on Coherence and Consistency of Registers (SCCR) (ERA/REP/15-2012) and the Workshop On Registers held in Lille on 12 March 2013 showed that there is a need for rationalisation of the vehicle-related registers in order to improve efficiency and remove duplication of data. The likely evolution of the legislation (amendments proposed by the Commission in the 4th Railway Package) must also be taken into account.

Purpose, scope and objectives	Agency Recommendation on rationalisation of vehicle-related registers (NVR, ERATV, VKMR, Certified ECMs), consolidating them in a single system and giving consideration to the problems reported by the stakeholders and recorded in SCCR.
Start date	1 Sep 2013
Milestones and end date	End of stage 1. Inception report: 31 December 2013 End of stage 2. Intermediate Report and CBA: 30 September 2014 End of stage 3. Recommendation, Final Report and CBA: 31 May 2015
Deliverables	Stage 1. Inception Report (ERA-REC-nn-2013-ACR) Stage 2. Intermediate Report and CBA (ERA-REC-nn-2013-ACR and ERA-REC-nn-2013-EEV) Stage 3. Final Report and CBA Recommendation including draft specification for registers (ERA-REC-nn-2013-REC)

Decision matrix (To identify with a symbol, i.e. ★, where the project is situated).



Internal resources	Interoperability Unit: Massimo Bellino, Gergana Simeonova-Arida Economic Evaluation Unit: to be appointed Resources&Support Unit: Jean-François Demoutiez, other staff for one-off specific expertise needs Directorate: legal officer Guido Starkle Other units: one-off specific expertise needs
Working Parties	Working party according to Art 3 of the Agency Regulation: Representative bodies, NSAs.

Additional information

The following main elements will be included in the project:

Stage 1. Defining the possible purposes and users of the registers

The purpose of the system of vehicle-related registers and its potential users will be defined for the three scenarios of the use of registers kept by Institutions:

1. traceability purpose only: no particular requirements on availability nor on real-time update
2. primarily traceability purpose and, in addition, data in the registers of vehicles may be used as reference data for operational business needs
3. traceability and operational purposes as far as EU legislation requires data exchanges between stakeholders

Note: This is to a certain extent covered in SCCR. This stage is mainly necessary for getting sure everybody understands the scenarios, associated purposes and users in the same way.

Stage 2. Defining the model of the vehicle related information

The model of the vehicle related information (as defined in the EU legislation) will be defined from

- static perspective (use cases, associated data and their attributes) and
- dynamic perspective (processes for data input and output)

For the definition of the model, the responsibilities of different actors will be considered as they are defined in the EU legislation.

The model will be mapped against the three scenarios as indicated for stage 1.

For each scenario the main aspects will be outlined (such as architecture, required service level, security) and other relevant aspects will be analysed (such as liabilities in the case of data not being available or not being correct).

Additionally, the following questions will be analysed (today such registers exist in some MS):

- May a registration in any other register apart from those set up by the European legislation be made mandatory for access to a network?
- If yes, for which purposes and to which extent?

A CBA will be carried out comparing the different scenarios. In particular, it will address associated costs, how they are distributed and sources of financing (e.g. fees for input or consultation of data) and associated benefits and how they are distributed.

At the end of stage 2, the results will be presented to DG MOVE and to the RISC, so that the most advantageous scenario be defined.

Stage 3. Defining the amendments to the registers specifications

According to the information model and the scenario selected, specifications of the registers will be reviewed and necessary amendments will be defined. This will cover the content, data format, functional and technical architecture, operating modes, rules for data exchange, input and consultation, service level.

The CBA will be further elaborated for refining the selected option.

Annex 5: Impact assessment

ERA-REC-102-2016/EEV V0.1

FOR

Rationalisation of Vehicle Related Registers (RVRR)

EUROPEAN UNION AGENCY FOR RAILWAYS

Making the railway system
work better for society.

Full Impact Assessment

Rationalisation of Vehicle Related Registers

	Elaborated by	*Validated by*	*Approved by*
Name	Oana Gherghinescu	Anna Gigantino	Jens Engelmann
Position	Project officer	Head of unit	Head of unit
Date	16/12/2016	20/12/2016	20/12/2016
Signature			

Document History

Version	*Date*	*Comments*
0.1	25/08/2016	Wrap up of the EcoEv section from the intermediate report; first version of FIA for the final report
0.2	29/08/2016	Updates – assessment of impacts
0.3	12/10/2016	Updates to C and B estimates for actions 3 and 33
1.0	16/12/2016	Final revisions; major version

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1. Context and problem definition

1.1. Problem and problem drivers	The **central problem** acknowledged by the participants to the RVRR WP is the **suboptimal usability** of vehicle related registers, which is fed by **4 main clusters of factors**: • *the limited usability of the registers for the administrative processes* • *the limited usability of the data from the registers as reference data* • *the duplication of efforts in feeding and extracting data from the registers* • *the asymmetric access to information* The **drivers** of the problem can be grouped as follows: *(A)* ***The limited usability of the registers for the administrative processes*** *is generated by* › the limited trust in the data › the registers' limited support for generating or exchanging documents (e.g. registers tools not flexible enough to accommodate national processes; no support to exchange of additional authorisations; limited reporting/statistics capabilities). ***(B) The limited usability of the data from the registers as reference data*** *is fed by:* › some categories of data are not accurate (e.g. organizations' contact details, data formats defined at EU/national level for certain categories of data are not respected); › some categories of data are not collected (e.g. email addresses, data for vehicle types placed in service before the entry into force of the Interoperability Directive); › some categories of data are not timely (e.g. because of deadlines not being defined); › some categories of data are overlapping (e.g. multiple registration for the same vehicle with driving cab; data for the same organization kept separately in each of the registers). ***(C) The duplication of efforts in feeding and extracting data from the registers*** *results from:* › the difficulty to perform cross-checks between the registers › the limited support that the registers can currently offer for the data collection and exchange. ***(D) The asymmetric access to information*** *results from:* › the limited support for data collection and exchange › the limited and/or unclear access to data. The project's detailed problem tree can be consulted in **Annex EcoEv 1**.

1.2. Stakeholders affected

This section shows the main stakeholders impacted by the problem, as well as the relevance of the problem for each of the categories selected from 1-low to 5-very high. ERA itself was considered in the list.

Category of stakeholder	*Importance of the problem*
NSAs	4
Railway Undertaking	4
Railway Infrastructure Manager	3
Railway Manufacturer	4
Railway Entity in Charge of Maintenance (ECM)	4
Railway Vehicle Keeper	4
Railway Vehicle Owner	4
Intergovernmental international organization	4
ERA	4

1.3. Evidence and magnitude of the problem

In one or more of the following occasions:

- the elaboration of the Study on Coherence and Consistency of Registers
- the Workshop on Registers (September 13th 2012)
- the elaboration of the final report on EU rail vehicle and infrastructure databases study provided by Atos to the European Commission
- working party meetings and bilateral discussions during the inception phase of the RVRR project,

the stakeholders reported the problem as having a high to very high magnitude due to the unfavorable effects on their activities:

- **Administrative burden for users** – a suboptimal usability of the registers leaves the user with just the burden of complying to their requirements, without offering a counterpart in terms of improving their processes;
- **A "siloed" approach as regards data** – the sub-optimal configuration of the registers and their associated processes foster the fragmented approach to data;
- **The sub-optimal use of reference data** – the current configuration of the system of vehicle-related registers leads to insufficiently exploiting the potential of data stored in them to be used as reference data for various processes.

1.4. Baseline scenario

The baseline would mean the continuation of the current framework without any change (i.e. applying the specifications in force of NVR, ERATV, VKMR and ECM). In broad lines, this would mean:

	› for the NVR and ECVVR: the continuation of the current framework for NVR and ECVVR is characterized by the lack of a harmonized implementation of the NVR decision. Data is redundant and inconsistent, which makes it lest trustworthy as reference data for the business processes. The baseline scenario is also affected by the lack of a defined maximum period for the registration process. On the top of that, access to data is difficult and the availability of ECVVR is affected by the level of stability of the decentralized NVRs connectivity. › for the ERATV: the baseline is affected by the limited coverage of the types populated in ERATV (not covering the existing types) and by the fact that it's not linked to RDD; › for the VKMR: the continuation of the situation as it is would be characterized by a manual input of data, a monthly publication and no possibility to use the data as reference data in the NVRs; › for the ECMCR: the baseline situation means a limited possibility to access data (only through web consultation of ERADIS) and no availability of data in the VVR. As can be noticed, the baseline is characterized by multiple short-comings which are likely to affect all the users of the registers.
1.5. Subsidiarity and proportionality	The registers which fall within the scope of the RVRR project are designed to cover the European dimension. Therefore, it is considered implicit that any change in the specifications should be done at EU level, also taking into account the need of alignment with OTIF. Moreover, in terms of costs, since the ongoing efforts of operating and maintaining the respective registers belong preponderantly to the Agency, **transferring this responsibility to the Member States would generate additional administrative burden, while affecting the effectiveness of the registers**. Since the specifications for NVR are already regulated at EU level, their rationalization should follow the same pattern so as to ensure a harmonized approach. Envisaging the modification of NVR specifications at national level would affect to a very high extent the use of data at EU level. Having registers' specifications rationalized and harmonized at EU level through the current project is an application of the **proportionality principle**. The current report explored an incremental setup of 3 options (Do minimum, Do medium, Do maximum) in order to allow for selecting the optimal level of effort for achieving the objectives of the project. The European Vehicle Register and the associated cost-benefit analysis are not part of this report and will be dealt with separately, as required by the 4th Railway Package.

2. Objectives

2.1. Strategic and specific objectives	<Mark, as appropriate, **the strategic objective(s)** with which this initiative is **coherent**.> ☐ Europe becoming the world leader in railway safety ☐ Promoting rail transport to enhance its market share ☒ Improving the efficiency and coherence of the railway legal framework ☐ Optimising ERA capabilities ☒ Transparency, monitoring and evaluation ☐ Improve economic efficiency and societal benefits in railways ☐ Fostering ERA reputation in the world The project's **general objective** is to contribute to *an improved usability, efficiency and effectiveness of the system of vehicle-related registers*. A set of **specific objectives** are defined in order to support the achievement of the general objective. They can be stated as follows: *(i) to improve registers' support to administrative processes, in line with the use cases identified;* *(ii) to increase the quality of data from the registers in view of opening the possibility for using it as reference data, in line with the business use cases identified;* *(iii) to minimize efforts for data collection, data exchange and cross-checks between the registers;* *(iv) to ensure that access to data and responsibilities in relation to managing the registers are defined and are clear for all involved parties.* In order to be achieved in practice, the above-mentioned specific objectives need to be backed up by a set of **operational objectives**, as follows: *a. to perform the necessary corrections, completions, updates and removal of overlaps for the data included in the vehicle-related registers;* *b. to better interface the registers' IT tools and to implement a common "look and feel" for all the registers falling in the scope of the project;* *c. to improve and automatize, where possible, the processes for data collection and exchange;* *d. to clarify and support the access to data for various categories of users and to manage the users' accounts needed for this purpose.* The link between the objectives and the problem analysis can be consulted in **Annex EcoEv 2** .
2.2. Link with Railway Indicators	The project's results are linked to the following Railway Indicators: RI 4.1 – Proportion of use cases served by the registers RI 4.3 – Proportion of data queries satisfactorily fulfilled RI 4.4 – Degree of satisfaction of the various end users

3. Options

3.1. High-level scenarios	A particular feature of the project is given by the fact that a set of three (rather strategic) alternative '**scenarios'** had already been defined in the phase of writing the ToR (prior to a problem analysis from the project, but however following the *Study on Coherence and Consistency of Registers*). These are: › Scenario 1 - Traceability purpose only › Scenario 2 - Primarily traceability purpose and reference data for the operational business needs › Scenario 3 - Traceability and operational purposes For these high-level, strategic scenarios in relation to the possible purposes of the registers a multi-criteria analysis (MCA) was performed by involving the members of the RVRR WP. The MCA showed that neither the NSAs, nor the sector expect the registers to serve operational purposes, at least for the time being. Details of the MCA on the high-level scenarios are included in **Annex EcoEv 3**.
3.2. List of options	***Note:*** ***To keep consistency with the impact assessment terminology, the current report refers to "options". The word "options"used hereinafter has to be read as having the same meaning as the word "scenario" used in the RVRR report.*** For the purpose of identifying the right means of achieving the operational objectives and addressing the list of identified problem drivers, a list of **40 proposed rationalization actions** has been gradually collected by the RVRR WP. Three **options** were built from the list of 40 rationalization actions, as follows: › Do Minimum (Do Min) › Do Medium (Do Med) › Do Maximum (Do Max)
3.3. Description of options	Several rounds of analysis have been run together with the stakeholders represented in the RVRR WP in order to allocate the 40 actions to the 3 above-mentioned options, based on the combined assessment of their importance and urgency, as part of the overall qualitative assessment process: › Do Min – highly important / critical / urgent actions › Do Med – additionally includes actions of medium importance and urgency

<table>
<tr><td></td><td>› Do Max – includes, in addition to the previous one, nice-to-have features, which are however not critically important / urgent

The grouping of the initially proposed rationalization actions in the 3 options is included Annex EcoEv 4.</td></tr>
<tr><td>3.4. Options' response to operational objectives</td><td>The following table assesses the extent to which the various options respond to the operational objectives, from 1-very low response to 5-very high response.
<table>
<tr><th></th><th>Do Min</th><th>Do Med</th><th>Do Max</th></tr>
<tr><td>To improve data in the registers</td><td>3</td><td>5</td><td>5</td></tr>
<tr><td>To better interface the registers' IT tools</td><td>1</td><td>4</td><td>5</td></tr>
<tr><td>To improve processes for data collection and exchange</td><td>1</td><td>5</td><td>5</td></tr>
<tr><td>To clarify and support access to data</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td>Overall</td><td>8</td><td>18</td><td>20</td></tr>
<tr><td>Average score (input for section 5.1)</td><td>2</td><td>4,5</td><td>5</td></tr>
</table>

An important remark related to Do Max consists of the fact that it includes the action related to setting up the European Vehicle Register, which was not sufficiently documented through a cost-benefit analysis.

In fact, at the workshop organized by the Agency on April 22nd 2015 and further on, at the RISC meeting on June 4th 2015, it was concluded that the Do Max option should not be considered, at least for the time being, due to the lack of sufficient evidence.

Moreover, the 4th Railway Package envisages that a cost-benefit analysis be anyway made for the European Vehicle Register.

Based on this rationale, only the actions from Do Min and Do Med are further retained in the quantitative analysis.</td></tr>
</table>

4. Impacts of the options

4.1. Impacts of the options (qualitative analysis)

For the **benefits** of the rationalization actions, a qualitative assessment was performed and included in each of the actions fiches (see paragraph D.6.1 from the action fiches – Annex 6 to the RVRR Report), followed by quantification.

For the **costs** of the rationalization actions, a quantification was performed (see next section).

4.2. Impacts of the options (quantitative analysis)

Detailed input on the quantification of costs and benefits for each of the rationalization actions is included in the action fiches (see paragraphs D.6.2 and D.7 from the action fiches – Annex 6 to the RVRR Report).

The overall view of the cost and benefit quantification is provided in **Annex EcoEv 5**.

It is important to underline that these are estimates based on the input collected from the NSAs and the sector, grounded on assumptions and can therefore not be considered as being accurate measurements.

Here below is a summary of the estimated costs and benefits, as well as their distribution per category of stakeholder for Do Min and Do Med.

Costs (euro)

Category of stakeholder	*Cost categories*	*Do Min*	*Do Med*
The Agency	Initial costs – one time	251200	817950
	Costs for backfilling the data – one time	0	106250
	Recurring costs / year	0	106750
NSAs using sNVR	Initial costs – one time (per NSA)	12100	13100
	Recurring costs / year (per NSA)	25200	25200
NSAs using non-standard NVR	Initial costs – one time (per NSA)	120260	146260
	Recurring costs / year (per NSA)	25200	25200
Overall at EU level	**Initial costs – one time**	**1971880**	**2995880**
	Recurring costs / year	**655200**	**761950**

Benefits (euro)

Category of stakeholder	*Do Min*	*Do Med*
NSAs (and the Agency, where applicable)	690008	891050
Applicants	574531	574531
Users	161250	519500
Overall at EU level	**1425790**	**1985081**

Benefit/Cost ration for a 20 year forecast (based on present values)

	Do Min	*Do Med*
B/C ratio (see section 5.2)	1,75	1,98

4.3. Uncertainties/risks	The analysis needs to be followed up as regards the European Vehicle Register, as also requested in the 4th Railway Package.

5. Comparison of options and preferred option

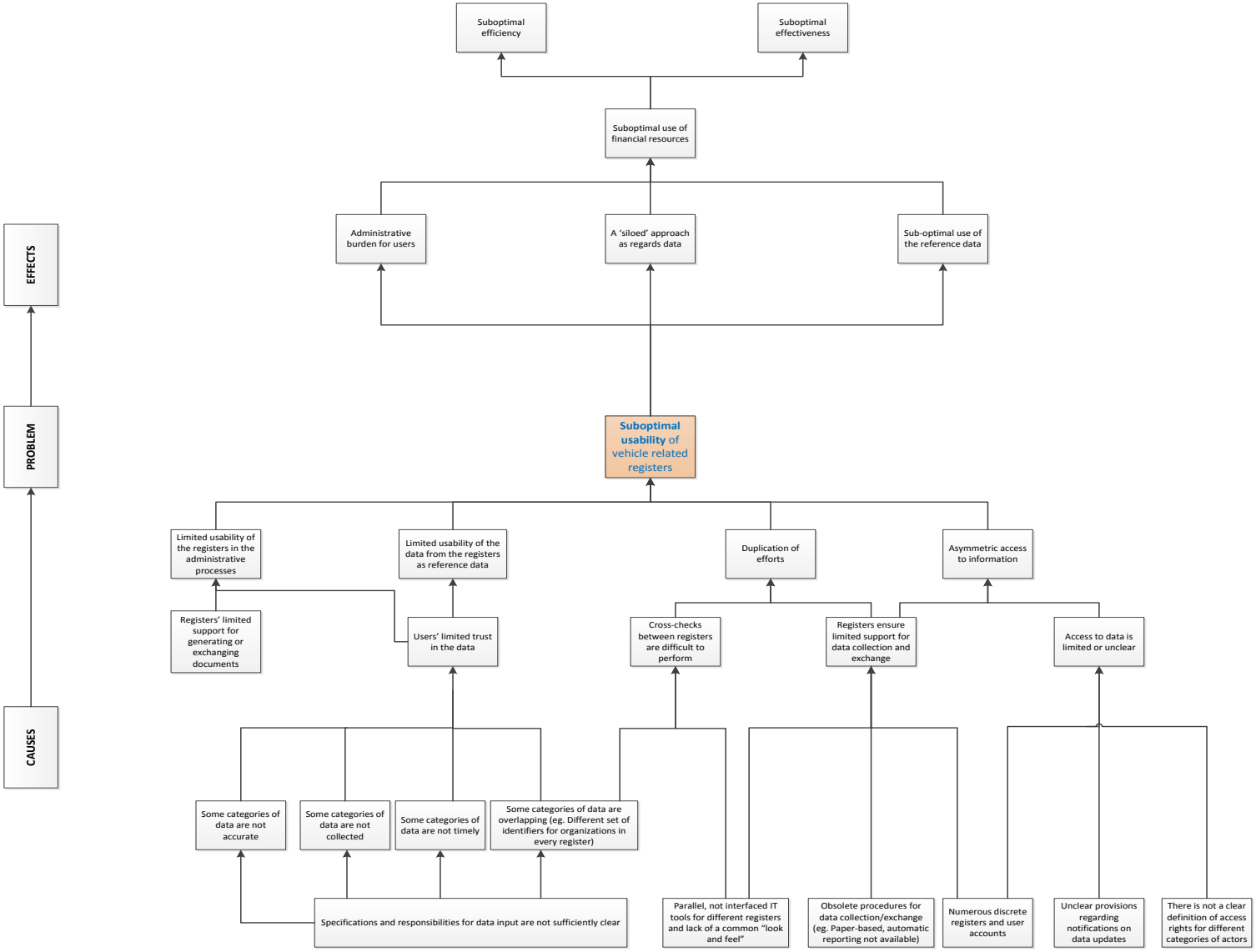
5.1. Effectiveness criterion	<Based on the scoring from section 3.3, rate the **overall effectiveness** of the options in achieving the specific objectives on a scale from 1 to 5.> *Do Min* | *Do Med* *Effectiveness* | 2 | 4,5
5.2. Efficiency (B/C ratio) criterion	<Based on the findings from sections 4.1 and 4.2, rate the **overall efficiency** (B/C ratio) of the various options as follows: • *1 if B/C ratio <1* • *3 if B/C ratio =1* • *5 if B/C ratio >1* *Do Min* | *Do Med* *Efficiency (B/C ratio)* | 5 | 5
5.3. Preferred option(s)	Based on the qualitative and quantitative assessment, option **Do Med** appears to be the preferred one.
5.4. Further work required	N.a.

6. Monitoring and evaluation

6.1. Monitoring indicators	A set of monitoring indicators have been defined for each action and are traceable in the action forms. In addition, the Agency is also monitoring the railway indicators: RI 4.1 – Proportion of use cases served by the registers RI 4.3 – Proportion of data queries satisfactorily fulfilled RI 4.4 – Degree of satisfaction of the various end users
6.2. Future evaluations	Future evaluations may be performed by the Agency within the framework of the strategy to be deleloped for the SPD Objective “Management of Railway Data”. A CBA is also requested by the 4th Railway Package as regards the European Vehicle Register.

7. Annexes EcoEv

7.1. Annex EcoEv 1



7.2. Annex EcoEv 2

Objectives	***Link to the problem analysis***
General objective	***Main problem*** *and its* ***main effects***
Contribute to an improved usability, efficiency and effectiveness of the system of vehicle-related registers.	*Suboptimal usability of the system of vehicle-related registers* *Suboptimal efficiency and effectiveness of the system of vehicle-related registers*
Specific objectives	***Problem sub-causes***
(i) to improve registers' support to administrative processes, in line with the use cases identified	*Limited usability of the registers in the administrative processes*
(ii) to increase the quality of data from the registers in view of opening the possibility for using it as reference data, in line with the business use cases identified	*Limited usability of the data from the registers as reference data*
(iii) to minimize efforts for data collection, data exchange and cross-checks between the registers	Duplication of efforts
(iv) to ensure that access to data and responsibilities in relation to managing the registers are defined and are clear for all involved parties	*Asymmetric access to information*
Operational objectives	***Problem drivers***
(a) to perform the necessary corrections, completions, updates and removal of overlaps for the data included in the vehicle-related registers	*Specifications and responsibilities for data input are not sufficiently clear*
(b) to better interface the registers' IT tools and to implement a common "look and feel" for all the registers falling in the scope of the project	*Parallel, not interfaced IT tools for different registers and lack of a common "look and feel"*
(c) to improve and automatize, where possible, the processes for data collection and exchange	*Obsolete procedures for data collection/exchange (e.g. Paper-based, automatic reporting not available)*
(d) to clarify and support the access to data for various categories of users and to manage the users' accounts needed for this purpose	*Numerous discrete registers and user accounts* *Unclear provisions regarding notifications on data updates* *There is not a clear definition of access rights for different categories of actors*

7.3. Annex EcoEv 3

The criteria used for performing the MCA, as shared by the members of the RVRR WP, include:

- Capacity to respond to the users' needs;
- Magnitude of technical changes required;
- Capacity to generate efficiencies in respect of IT provision;
- Level of risks related to the management of registers;
- Capacity to simplify processes;
- Level of costs;
- Magnitude of legal changes required.

A template including the MCA matrix for the comparison of scenarios, in both its simple and weighted forms, has been provided to the members of the RVRR WP as an annex of the Discussion Document, quoted in section 3 above. Filling in the matrix has been performed by both the sector's representatives and NSAs, as it was expected that slight differences could occur in both the individual scoring and the weights allocated to various criteria.

In order to be able to grant the scores in the MCA matrix, participants have considered that it would be more appropriate that the assessment of actions would be finalized before, as that was likely to provide useful input for the scoring in terms of identifying the impacts of the three scenarios. As a consequence, chronologically, the scoring for the MCA has been concluded after the qualitative assessment of actions and the mapping of hypotheses against the three pre-defined scenarios.

Participants to the workshop on 12/11/2014 have expressed a common view as regards the expected *administrative purpose* of the registers, with an optional perspective of ensuring support to business processes as reference data.

The scores granted by the NSAs and OTIF (NSA-O) and sector organizations (S), respectively, during the 2nd Eco-Ev workshop, and later shared by all the participants to the RVRR WP meeting on November 25th 2014, are reflected in Table 6.

Table 1 Outcomes of the MCA for the high-level scenarios

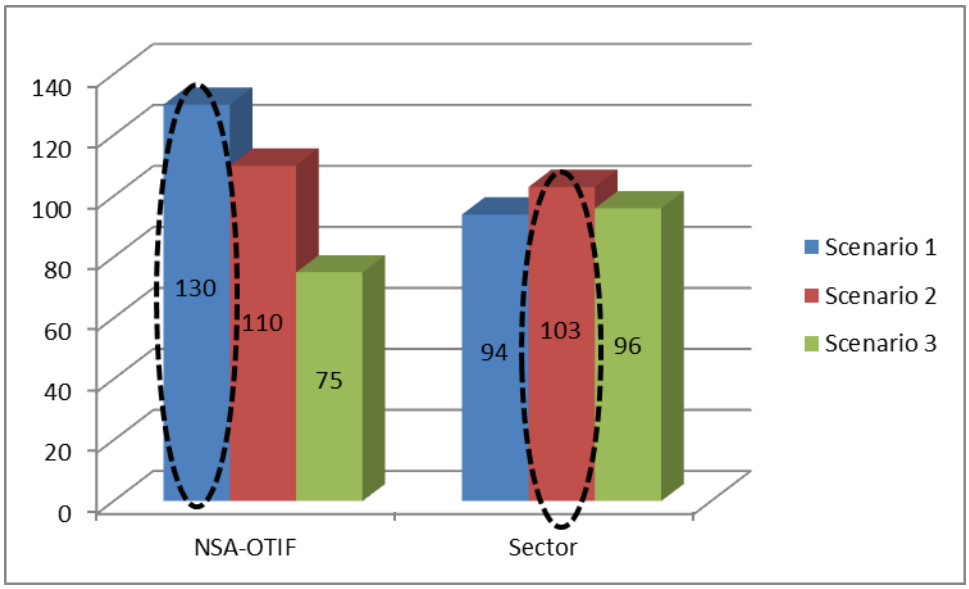
Simple scores[1]		Capacity to respond to the users' needs	Magnitude of technical changes required	Capacity to generate efficiencies in respect of IT provision	Level of risks related to the management of registers	Capacity to simplify processes	Level of costs	Magnitude of legal changes required	**TOTAL**
Scenario 1 Traceability purpose only	**NSA-O**	20	20	15	20	15	20	20	**130**
	S	15	12	15	15	15	12	10	**94**
Scenario 2 Primarily traceability purpose+ reference data for the operational business needs	**NSA-O**	15	15	20	15	15	15	15	**110**
	S	18	12	18	15	18	12	10	**103**
Scenario 3	**NSA-O**	10	10	10	10	15	10	10	**75**

[1] *Simple scores for one scenario according to one criterion can range from 1 (least performing) to 20 (best performing)*

Simple scores[1]		Capacity to respond to the users' needs	Magnitude of technical changes required	Capacity to generate efficiencies in respect of IT provision	Level of risks related to the management of registers	Capacity to simplify processes	Level of costs	Magnitude of legal changes required	**TOTAL**
Traceability and operational purposes	**S**	18	10	18	12	20	8	10	**96**
WEIGHT[2]	**NSA-O**	10	5	5	10	5	10	5	
	S	10	5	10	5	5	10	1	
Weighted scores		Capacity to respond to the users' needs	Magnitude of technical changes required	Capacity to generate efficiencies in respect of IT provision	Level of risks related to the management of registers	Capacity to simplify processes	Level of costs	Magnitude of legal changes required	TOTAL
Scenario 1 Traceability purpose only	**NSA-O**	200	100	75	200	75	200	100	**950**
	S	150	60	150	75	75	120	10	**640**
Scenario 2 Primarily traceability purpose+reference data for the operational business needs	**NSA-O**	150	75	100	150	75	150	75	**775**
	S	150	60	180	75	90	120	10	**715**
Scenario 3 Traceability and operational purposes	**NSA-O**	100	50	50	100	75	100	50	**525**
	S	180	50	180	60	100	80	10	**660**

Variation in scoring is not significant either between the teams or between the scenarios. However, the ranking of the scenarios is not identical between the two groups of stakeholders. Thus, based on the simple scoring, the participants from the NSAs and OTIF have given the highest score to Scenario 1, while participants from the sector, to Scenario 2, as can be seen from Figure 2.

Figure 1 MCA for the scenarios – simple scoring



[2] *The weights for the criteria could be 1-low importance; 5-medium importance or 10-high importance*

While performing the weighted MCA, both teams considered the very same level of importance (weight) for 4 out of the 7 criteria:

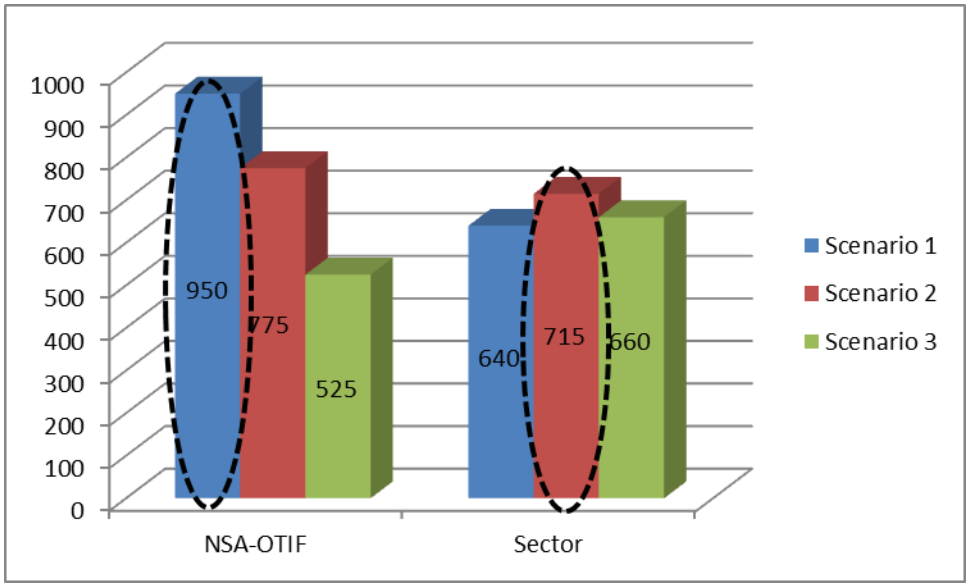
- Capacity to respond to the users' needs, considered highly important;
- Magnitude of technical changes required, considered as having medium importance;
- Capacity to simplify processes, considered of medium importance;
- Level of costs, considered of high importance.

The three criteria for which importance was assessed differently by the two groups of stakeholders are:

- *Capacity to generate efficiencies in respect of IT provision*, considered to be of high importance for the sector representatives and of medium importance for the participants from NSAs and OTIF;
- Le*vel of risks related to the management of registers*, considered highly important by the participating NSAs, but of medium importance by the sector representatives;
- *Magnitude of legal changes required*, considered of medium importance by the NSA representatives and of low importance by the sector.

The ranking of the scenarios following the application of the weighted MCA is preserved for the two teams as compared to the simple scoring (see Figure 3).

Figure 2 MCA for the scenarios – weighted scoring



The application of the MCA leads to the following conclusions as regards the three alternative scenarios proposed in the ToR of the project:

(1) ***Scenario 1*** *(*Traceability purpose only*) and* ***Scenario 2*** *(*Primarily traceability purpose + reference data for the operational business needs*) have been both* ***retained****. It is worth noting that Scenario 2 is an incremental alternative of Scenario 1. The outcomes of the MCA are in line with:*

a. ***the problem analysis****: both the limited usability of the registers in the administrative processes and the limited usability of the data from the registers as reference data have been stated in the problem identification (see Figure 1 and Table 5);*

b. ***the view on how the registers should look and work in the future****: there was a converging view from the stakeholders that registers should play an administrative role, but support to business processes was also envisaged in terms of providing good quality data that could be used as reference data (see Annex Eco-Ev 1);*

c. ***the profile of the organizations represented in the RVRR WP****: the NSAs main interest is in the administrative role that they can play, while for the sector, an additional dimension becomes meaningful, i.e. that of having the opportunity to use the data from the registers as reference data for operational purposes. It is worth mentioning that the data from the registers will serve only a part of the data needs for operational purposes and will be complemented with other sources of data, based on the specific business needs.*

(2) ***Scenario 3****, which envisaged ensuring both* traceability and operational purposes *for the system of vehicle-related registers, has been* ***discarded*** *by all the stakeholders sitting in the RVRR WP. This outcome of the MCA is in line with:*

a. ***the problem analysis****: when asked whether registers not being operational was perceived as a problem, all categories of stakeholders stated that this is not currently either a problem or a need for any of the organizations, not even for the sector organizations;*

b. ***the view on how the registers should look and work in the future****: all categories of stakeholders expressed that the main expected use of the registers should be administrative, with the possibility for data to be used as reference data for operational purposes.*

7.4. Annex EcoEv 4

No.	Title*	Do Min	Do Med	Do Max
1	Remove the transitional provision of the NVR Decision allowing double registration of vehicles with driving cabs	x	x	x
2	Clarify that no more parameters than those specified in the NVR Decision may be requested for registration purposes	x	x	x
3	Add the possibility for the RE to ask for supporting documents to ensure that the organizations identified in the NVR registration have acknowledged the designation	x	x	x
4	Add the manufacturer serial number as optional data element in NVR	x	x	x
5	Send notifications of NVR data changes to involved organizations	x	x	x
6	Define and enforce data format conventions	x	x	x
7	Provide automatic data quality reports in VVR	x	x	x
8	Set a maximum timeframe for the registration of changes in the NVR and the publication of data in ECMCR. Clarify the scope of the validation by ERA in ECMCR and VKMR	x	x	x
9	Specify that the Registration Holder in NVR is the (registered) keeper	x	x	x
10	Collect emails for all organizations identified in the vehicle registration	x	x	x
11	Add contact details of the Authorisation Holder as mandatory data in ERATV	x	x	x
12	Formalize access rights for RH, ECM, OTIF Secretary, OTIF Competent Authorities in NVR	x	x	x
13	Enable IMs/RUs to search by list of max 50 EVNs	x	x	x
14	Implement web services for automatic consultation of data		x	x
15	Implement a VVR multilingual user interface		x	x
16	Rationalize the management of restrictions in NVR	x	x	x
17	Implement access to ECM Certificate data via VVR		x	x
18	Implement search by Vehicle Type ID in VVR		x	x
19	Modify the NVR Specification to add the date of suspension of authorisation and the revoke of an authorisation	x	x	x
20	Implement a functionality in standard NVR to schedule changes of owner/keeper/ECM	x	x	x
21	Removal of typos and clarifications in the NVR Decision	x	x	x
22	Re-design the graphical user interfaces of standard NVR, VVR and ECMCR (ERADIS) in line with the ERATV layout			x
23	Implement automatic VVR reports aggregating data from the vehicle-related registers		x	x
24	Implement an IT tool for the VKMR. Set a maximum timeframe for the validation of requests		x	x
25	Add the VKM list as reference data in standard NVRs		x	x
26	Implement a web-based electronic form for the submission of type technical data to the NSA			x
27	Synchronize of ERATV and RDD lists of parameters for which conformity is assessed according to notified national rules		x	x
28	Allow voluntary registration of existing vehicles types in ERATV			x
29	Implement electronic web-based multilingual form in standard NVR for submission of registration/modification applications		x	x
30	Implement a Reference File for the organizations identified in the registers		x	x

No.	Title*	Do Min	Do Med	Do Max
31	Implement an entry point to the vehicle-related registers		x	x
32	Define a standard file for the exchange of additional authorisations. Modify the standard NVR to support the export to/import from the standard exchange file	x	x	x
33	Define standard templates for several registration documents. Modify standard NVR and ERATV to be able to produce such documents		x	x
34	Implement a European Vehicle Register (EVR) in ERA			x
35	Enable EU user accounts for the NVRs			x
36	Implement automatic email notifications of changes to the data to all involved actors	x	x	x
37	Implement an active dashboard for EVR users			x
38	Tool for providing the interoperability level of the rail system			x
39	Support to specific administrative business processes (e.g. the authorisation process)			x
40	TAF compliant messaging of changes to operational databases			x

* titles of the actions as initially proposed, when the list was set up and the options were defined. Subsequent revisions of the action titles are accurately reflected in the action fiches.

7.5. Annex EcoEv 5

a) Assumptions

Parameters used in the assessment of costs	**Value**	**Unit**
Average** fee/day for **IT development**	650	€
Average* salary/day NSA (not including IT development effort)	200	€
Costs/day for WP meeting	12000	€
Coefficient for the effort related to changes in non-standard NVRs compared to the sNVR	1,8	
Staff cost savings/day for the applicants and the users	300	€
* considering the variation at EU level		
** considering the variation at EU level and the various profiles of experts involved (designer, programer, analy		
Parameters used in the assessment of benefits		
No. of registered vehicles in the EU	1000000	
No. of trains	150000	
No. of vehicle types	200	
No. of authorized users of VVR	2000	
No. of registered organizations in the NVR	5000	
No. of new registrations in VKMR per year	200	
No. of first registration/year	25000	
No. of first authorizations/year	6000	
No. of updated registrations/year	55000	
No. of duplicates (Jan 2015)	500	
No. of additional authorizations/year	2600	
No. of queries in NVR	1000	

b) Initial costs

		The Agency				NSA (standard NVR)					NSA (non-standard NVR)					Backfill effort
Action number	Cost driver	Quantity	Unit	Cost/unit	Total cost	Cost driver	Quantity	Unit	Cost/unit	Total cost	Cost driver	Quantity	Unit	Cost/unit	Total cost	
1	N.a.	0	N.a.	0	0	Time needed for processing double registrations	15	day	200	3000	Time needed for processing double registrations	15	day	200	3000	
2	Costs for organizing WP meetings	5	day	12000	60000	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
3	Costs for organizing WP meetings	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
4	IT development costs	20	day	650	13000	N.a.	0	day	0	0	IT development costs	36	day	650	23400	
5	IT development costs	30	N.a.	650	19500	N.a.	0	N.a.	0	0	IT development costs	54	N.a.	650	35100	
6	Costs for organizing WP meetings	1	day	12000	12000	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
	Costs for the modification of ECVVR and ERADIS	30	day	650	19500	Costs for modifying the local database and for deploying the updated sNVR	8	day	650	5200	Costs for modifying the local database and for deploying the updated sNVR	14,4	day	650	9360	
7	Effort for veryfing ECVVR data	20	day	650	13000	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
8	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
9	N.a.	0	N.a.	0	0	Costs for updating the national application guide	5	day	650	3250	Costs for updating the IT tool and national application guide	20	day	650	13000	
10	Costs for modifying sNVR	15	day	650	9750	N.a.	0	N.a.	0	0	Costs for updating the IT tool	10	day	650	6500	106250
11	Costs for modifying the ERATV tool	8	day	650	5200	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
12	Costs for modifying the IT tools	10	day	650	6500	N.a.	0	N.a.	0	0	Costs for mdifying the non-standard NVR	18	day	650	11700	
13	Costs for modifying the IT tools	10	day	650	6500	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
14	Costs for modifying VVR	50	day	650	32500	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
	Costs for organizing WP meetings	2	day	12000	24000	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
15	Costs for modifying the IT tools	40	day	650	26000	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
16	Costs for organizing WP meetings	1	day	12000	12000	Costs for the initial general data revision	1	day	650	650	Costs for the initial general data revision	1	day	650	650	
17	Costs for modifying the IT tools	35	day	650	22750	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
18	Costs for modiying the IT tools	25	day	650	16250	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
19	Costs for modifying the IT tools	15	day	650	9750	N.a.	0	N.a.	0	0	Costs for modifying the IT tool	7	day	650	4550	
20	Costs for modifying the IT tools	20	day	650	13000	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
21	Costs for modifying the IT tools	30	day	650	19500	N.a.	0	N.a.	0	0	Costs for modifying the IT tool	20	day	650	13000	
23	Costs for organizing WP meetings	0,5	day	12000	6000	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
	Costs for modifying the IT tools	90	day	650	58500	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
24	Costs for modifying the IT tools	125	day	650	81250	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
25	Costs for modifying the IT tools	20	day	650	13000	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
27	Costs for modifying the IT tools	120	day	650	78000	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
29	Costs for modifying the IT tools	40	day	650	26000	Costs for assiting the RH in using the tool	5	day	200	1000	N.a.	0	N.a.	0	0	
30	Costs for modifying the IT tools and migration	see solution 1 (action form)		see solution 1 (action form)	66000	N.a.	0	N.a.	0	0	Cost for IT tool for backfill of organisation codes in non-standard NVR	40	day	650	26000	
31	Costs for modifying the IT tools	150	day	650	97500	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
32	Costs for organizing WP meetings	0,5	day	12000	6000	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
	Costs for modifying the IT tools	20	day	650	13000	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
33	Costs for organizing WP meetings	0,5	day	12000	6000	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
	Costs for modifying the IT tools	20	day	650	13000	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
36	Costs for modifying the IT tools	20	day	650	13000	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	
	TOTAL				817950					13100					146260	106250

c) Recurring costs

	The Agency					NSA (standard NVR)					NSA (non-standard NVR)				
Action number	**Cost driver**	**Quantity**	**Unit**	**Cost/unit**	**Total cost**	**Cost driver**	**Quantity**	**Unit**	**Cost/unit**	**Total cost**	**Cost driver**	**Quantity**	**Unit**	**Cost/unit**	**Total cost**
1	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
2	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
3	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
4	N.a.	0	N.a.	0	0	Staff effort for data input	15	day	200	3000	Staff effort for data input	15	day	200	3000
5	N.a.	0	N.a.	0	0	Staff effort for preparing the procedure and sending the notifications	7	day	200	1400	Staff effort for preparing the procedure and sending the notifications	7	day	200	1400
6	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
7	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
8	N.a.	0	N.a.	0	0	Staff effort to complete the process within the deadline	80	day	200	16000	Staff effort to complete the process within the deadline	80	day	200	16000
9	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
10	N.a.	0	N.a.	0	0	Staff effort	12	day	200	2400	Staff effort	12	day	200	2400
11	N.a.	0	N.a.	0	0	Staff effort	12	day	200	2400	Staff effort	12	day	200	2400
12	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
13	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
14	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
15	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
16	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
17	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
18	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
19	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
20	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
21	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
23	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
24	Costs for maintenance and support	35	day	650	22750	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
25	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
27	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
29	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
30	Costs for maintenance and support	see LIA	see LIA	see LIA	45000	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
31	Costs for maintenance and support	60	day	650	39000	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
32	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
33	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
36	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0	N.a.	0	N.a.	0	0
	TOTAL				**106750**					**25200**					**25200**

d) Benefits

	NSAs (and the Agency, where applicable)						Applicants						Users					
Action number	Benefit driver	Quantity	Unit	Days saved/unit	Saving/day	Total benefit	Benefit driver	Quantity	Unit	Days saved/unit	Saving/day	Total benefit	Benefit driver	Quantity	Unit	Days saved/unit	Saving/day	Total benefit
1	Savings from keeping the registration updated	500	duplicate	0,5000	200	50000	Savings at the moment of registration	500	duplicate	0,5000	300	75000	Savings from retrieving the correct information	25	duplicate	0,2500	300	1875
	Savings from retrieving the correct information	25	vehicle	0,1250	200	625	Savings from keeping the registration updated	500	vehicle	0,5000	300	75000	N.a.	0	N.a.	0,0000	0	0
2	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
3	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
4	Savings on time for searching the number in the technical documents	750	vehicle	0,1875	200	28125	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
5	N.a.	0	N.a.	0,0000	0	0	Time saved for keepers when searching the modifications	55000	modif	0,0104	300	171875	Savings from avoiding paper-based communication	16500	letter		5	82500
6	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0	Time saved for errors related to data format	600	queries	0,0625	300	11250
7	Savings on time as regards missing or wrong data in ECVVR	45000	data categories	0,0208	200	187500	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
8	N.a.	0	N.a.	0,0000	0	0	Savings on time for periodical checks on whether changes have been registered	14850	changes	0,0104	300	46406	N.a.	0	N.a.	0,0000	0	0
9	Savings on time in the case of first registration	400	vehicle	0,0208	200	1667	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
10	The action is a pre-requisite for action 5	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
11	Savings on time from contacting the authorisation holder	2	contact	0,0208	200	8,33	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
12	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
13	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0	Time saved for consultation	1000	train	0,0104	300	3125
14	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
15	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0	Savings on time for getting used to the correspondence of terms	500	user	1,0000	300	150000
16	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
17	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0	Time saved for consultation	105000	train	0,004167	300	131250
18	Savings on time for searching some data categories	52	day	0,2500	200	2600	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
19	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
20	Savings on time thanks to better planning	200000	change	0,0104	200	416666,67	Savings on time	66000	change	0,0104	300	206250	N.a.	0	N.a.	0,0000	0	0
21	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
23	Savings on time for preparing the reports	6	report	2,0000	200	2400	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
24	Savings on time by using the IT tool	200	registration	0,0625	200	2500,00	N.a.	0	N.a.	0,0000	0	0	Savings from using paperless communication	200	registratio	N.a.	10	2000
25	Savings on time	200	registration	0,0208	200	833,33	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
27	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
29	Savings on time for the new registrations	30000	registration	0,0104	200	62500	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
	Savings on time for the modifications	280000	modification	0,0021	200	116666,67	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
30	Savings on time when updating the registers	4000	changes	0,0104	200	8333,33	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
31	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0	Savings on time in case of multiple step queries	24000	queries	0,0104	300	75000
32	Savings on time from simplifying the input for additional authorizations	2600	authorizations	0,0104	200	5416,67	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
33	Savings on time from issuing the receipts	2500	registration	0,0104	200	5208,33	N.a.	0	N.a.	0,0000	0	0	N.a.	0	N.a.	0,0000	0	0
36	N.a.	0	N.a.	0,00	0	0	N.a.	0	N.a.	0,00	0	0	Savings on time from avoiding additional checks	20000	check	0,01	300	62500
	TOTAL					891050,00						574531,25						519500