

REETS TEN

Activity 6: Return on experience

D 6.1

B. Report on return on experience on technical matters



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Introduction

Activity 6 aims at disseminating the key results of the project to the external stakeholders in order to ensure a constant channel of communication with them. The experiences gained through the project main activities are shared with other organizations, consultancies, public authorities and experts who work specifically in the field of electronic tolling and interoperability. They will have the opportunity to interact with the project consortium and work package leaders providing their concrete feedbacks, inputs and analysis concerning the major findings of the project.

Activity 6.1 b, the Report on “return on experience on technical matters”, provides a wide and comprehensive picture of all the technical issues related to the implementation of the EETS. These “technical matters” are deeply analyzed and some key recommendations are put forward to provide more clarity and certainty on these important issues. Activity 2, 3 and 4 of the REETS project have been studied the very issues of certification and accreditation, key performance indicators and back-office interfaces and security policies. The following chapter will present the key findings of the work of the REETS technical experts.

3 Activity: Results and Benefits of the Analysis

3.1 Scope and Objectives

Art II.2.3 of EC Funding Decision defined the scope and objectives of Activity 2 as follows:

The activity certification includes an analysis of current certification procedures covering both conformity to specifications and suitability for use. As a result recommendations for EETS certification procedures will be developed.

The project will gather the approaches and practices specific to conformity and suitability for use and will analyze common elements and differences in order to deliver a shared picture of the existing situation.

The work on a shared understanding on certification is focused on contributing to the profiling of specifications against which conformity assessment can be performed independently of any toll domain. Current testing procedures, in particular those with cost/resource-intensive requirements, will be analyzed. A proposal will be provided on how the conformity to specification step can ease the suitability for use tests (as indicated in the EETS Decision 2009/750/EC) which are preliminary to local EETS implementations.

The project also analyses common elements, differences and potential problems of different suitability for use procedures in different toll domains. The procedures may need to be revised to the extent possible to fully support Toll Chargers and EETS Providers respective needs and expectations. This includes, among others, the initial checking of documentation provided by EETS Providers in the beginning of the suitability for use procedure.

The work will include the development of proposals for common structures of test procedures (trial operations and pilot operations) and agreed time schedules for cost efficient testing in individual toll domains. A list of common tests/test cases and a list of specific local test cases per toll domain may be developed. This tool will help both EETS-Providers and Toll Chargers to efficiently organize the suitability for use tests.

The project will assess variants of suitability for use procedures depending on the involvement of manufacturers and/or Notified Bodies.

The project will also analyze the potential of shared test sites for DSRC based systems and enforcement systems for GNSS based systems that also may contribute to more efficient testing procedures.

Recommendations shall be derived that support the process to be performed efficiently throughout different EETS domains and to explore the synergies while respecting existing definitions and implementations of suitability for use procedures in the toll domains.

3.2 Findings and recommendations 3.2.1 Topic 1: Clarification of terminology

- **Description of topic and the related barriers**

The analysis of existing registration and accreditation procedures, provided in report D2.1, has shown that there was no common understanding of some terms used in the EETS decision. That applied in particular to the terms "conformity to specifications" and "suitability for use", mentioned in Annex IV of the EETS decision.

Not being able to reference to precise definitions of these technical terms and underlying processes hindered a common understanding of technical processes and detailed discussion of the process steps.

- **Main findings, recommendations and proposed measures**

It turned out that using the terms "conformity to specifications" and "suitability for use" as high level starting points for the examination might be misleading. It is rather important to describe to technical requirements for the phases "registration of an EETS Provider" (Article 3) and "accreditation of an EETS Provider in a toll domain" (Article 5).

Furthermore, the analysis of existing procedures has shown that the current status in some toll domains includes the assessment of conformity to specifications which are toll domain specific as part of the technical accreditation of EETS Providers in these toll domains.

To depict this current status, a new structure of the certification process has been defined with 2 phases:

1. Registration of EETS Providers

1.1 Conformity to toll domain independent specifications

2. Technical accreditation of EETS Providers in a toll domain 2.1

Conformity to toll domain specific specifications (if required)

2.2 Suitability for use

Each Toll Charger has to define the scope of the phases 2.1 and 2.2 according to their toll domain specific needs. In some toll domains the phase 2.1 could be skipped completely if it is of no support for the suitability for use phase.

- **Benefits and cost effectiveness of the recommendations**

The clarification of terminology and the identification of the existence of toll domain specific specifications in the various toll domains were essential for further work. In particular, the evaluation of toll domain specific specifications and their implications was essential to develop proposals for further harmonization of technical accreditation processes.

3.2.2 Topic 2: Technical requirements for registration

- **Description of topic and the related barriers**

The checking of technical requirements during the registration procedure shall provide evidence to Member States, who are in charge of registration, and the Toll Chargers that the EETS Providers system is in general capable of providing the relevant technical services in the toll domains.

The EETS decision does not precisely describe the technical requirements to be fulfilled. A comprehensive list of interoperability constituents and technical standards or specifications that need to be fulfilled was missing. That creates a difficult situation for Member States as they are responsible to implement this registration process. Since a successful registration in one Member State grants the EETS Providers the right to enter into accreditation procedures with all Toll Chargers, a common technical level needs to be enforced.

- **Main findings, recommendations and proposed measures**

The report identified interoperability constituents concerning registration of an EETS Providers as constituents involved in interfaces between a Toll Charger and an EETS Provider, but restricted to the EETS provider's equipment. Therefore the required interoperability constituents concerning registration are:

1. EETS Front End (On-board equipment including proxy functionality, regardless if the proxy will be collocated with the EP's Central System)

2. EETS Providers' Back End with the interfaces for

- a. data exchange with the Toll Charger,
- b. interaction with the driver,
- c. vehicle registration data

The Technical Registration phase is part of a well-defined institutional path; it has to be clearly and easily understood; therefore it should refer to formal documents only (legislation, approved standards) and should not need the support of technical tests.

A checklist of the standards or other official specifications to which EETS equipment has to be compliant is beneficial to all the parties, especially to manufacturers and to the

Member States Authorities involved in the process. Along this line, the report has listed EFC specific and general standards and specifications that should be checked during registration.

For the purpose of maintaining a rigorous definition of the EETS, it is recommended that the NB-EETS Coordination Group, consistent with the draft powers given to it by the EC:

1. elaborates, publishes and maintains an up to date list of applicable documents (including references to standards) that contain the requirements and the associated conformity assessment tests;
2. elaborates and publishes a list of required documents to sustain the Declaration of Conformity (DoC). Such a list would provide an effective support for the registrar that is responsible for verifying the validity of the statements by the candidate EP;
3. elaborates, publishes and maintains a set of common criteria applied by NBs for the NBs' statements, with the aim to achieve equivalence of working practices and ensuring a level playing field.

Compliance to IT security requirements cannot be assessed at registration moment due a missing EETS security policy. For the moment, this assessment must be postponed to the accreditation phase. It is highly recommended to develop an EETS security policy as soon as possible. If in future an agreed EETS security policy is available, assessment could be carried out for registration purposes.

- **Benefits and cost effectiveness of the recommendations**

The report identified the scope of interoperability constituents and standards and specifications that should be checked by Member States during the registration of an EETS Provider. Furthermore, the report provides recommendations for the future maintenance of a set of common technical requirements for registration.

This provides Member States with important information when designing and maintaining their administrative procedures. It also reduces the risk that Member States set differing requirements. A common approach will ensure an equal level of EETS Provider's technical systems capabilities that Toll Chargers can build upon in defining their requirements for the technical accreditation procedures.

3.2.3 Topic 3: Technical accreditation

- Description of topic and the related barriers

Technical accreditation procedures are defined by Toll Chargers to check the compliance of the EETS Provider's technical system with the requirements of the toll domain. The analysis has shown that the current situation of these procedures is very heterogeneous. Many Toll Chargers have defined toll domain specific requirements and EETS Provider's need to prove their compliance to them before being able to enter end-to-end tests of the whole process. This situation creates a significant burden for EETS Providers as they are facing differing accreditation procedures in all toll domains. Potentially they need to adapt their technical systems according to toll domain specific specifications and follow different test procedures.

- Main findings, recommendations and proposed measures

Based on the results of the analysis of technical accreditation requirements, a **common phase model** has been proposed that can be applied to all toll domains:

1. Checking of preconditions
2. OBE and back office systems tests in a test environment
3. Trials in a test environment under operational conditions
4. Pilot operation in the operational environment

To facilitate early testing of systems interfaces, Toll Chargers should, if possible, provide an **examination framework (test system) for their back office interfaces** where EETS Providers can test their implementations before entering into end-to-end tests. Such test systems should also be accessible directly by manufacturers without prior involvement of EETS Providers. **Manufacturers** should certify their interoperability constituents by their own and assist both EPs and TCs during the Technical accreditation phase. **Notified Bodies** can be involved as trusted third parties for checking the EP's conformity to toll domain specific specifications) and Technical accreditation.

The report analyzed the potential of building **clusters** of toll domains and to setup **common test sites**. Toll Chargers who, at least, share the same technology for ETC, should seek to optimize and adopt toll domain independent requirements whenever possible, in order to drive the development of a simple and effective common service. Optimization by Toll Chargers, of processes for testing of an OBU model is of the decision of the concerned Toll Chargers and should be on a voluntary basis. Close and efficient cooperation between the Toll Chargers is required to build the new framework of interoperability qualification of an OBU model.

Two proposals have been described to further reduce the complexity of the technical accreditation process and reduce the effort for the procedure:

1. Centralized approach for testing Toll Domain specific specifications
2. Harmonizing technical requirements and mutual recognition

Toll Domain specific specifications should be kept to a minimum necessary and be made available publicly or without further preconditions to manufacturers, suppliers or EETS Providers on request. In order to reduce the cost of introducing the EETS service, development of common technical requirements that can be tested centrally (potentially clustered by certain technical criteria) and assessment of the compliance of the EETS Providers system with the requirements of more than one Toll Domain (see also section on Common test sites) is necessary. In such a scenario, even if there is no accreditation procedure for Toll Chargers, also their equipment needs to be compliant to the applicable standards and specifications.

The report not only analyzed requirements for a first-time accreditation but also elaborated recommendations for the **maintenance of a technical accreditation** considering that technical systems change regularly. Toll Chargers should provide transparent conditions which require a (partly) reiteration of the process of Technical accreditation. EETS Providers should provide Toll Chargers with all necessary information on changes of their technical system to assess the severity of the change. Toll Chargers should also inform EETS Provider about changes in their system which potentially require a (partly) reiteration of the process. Toll Chargers should investigate the possibility to develop a common protocol for assessing changes of the technical systems and the consequences for the Technical accreditation procedure. This would allow a better analysis of the impact of these changes in the several Toll Domains.

The report analyzed the possibilities to check the EETS Provider's system and organization against **IT security requirements** as laid out in REETS report D4.3. The security conformance tests of a TSP's implementation of security measures for REETS shall be performed according to a four step-process:

1. The TC shall audit the Information Security Management System based on the relevant available TSP documentation
2. The TSP shall provide an Implementation Conformance Statement (ICS) of the security requirements and measures
3. The TC shall assess ICS and the effectiveness of the security measures selected by the TSP.
4. The TSP is responsible for drawing up a test plan. The TSP shall provide a test report that, in addition to the items enumerated for the test plan, includes the identification of test log record, for auditability and repeatability and an overall assessment of the test result
5. The TC shall assess the test report, with or without support from a third party, and decides if he is convinced of the correct implementation and effectiveness of the security measures

In addition, the TC may wish to carry out a security related evaluation or audit in order to gain additional confidence and assurance that one or several parts of the TSP's system are not associated with undue weak links or security leaks. For the future development of EETS, it is recommended to draw up an implementation conformance statement of security requirements and measures, based on the Annex B of CEN/TS 16439 on EFC- Security Framework.

Finally, some general recommendations were developed that further might reduce the complexity of the technical accreditation process:

1. If possible, Toll Charger should provide technical specifications and all other relevant documents also in English language.
2. Technical specifications should be available to manufacturers or EETS Providers on request, even before any official Technical accreditation procedure has been started officially. That would allow the implementation and testing of technical systems against Toll Charger requirements before entering into cost-intensive tests. Furthermore, the availability of these specifications would allow manufacturers and suppliers to develop technical equipment for the EETS market.
3. Toll Chargers should submit to the EETS providers a transparent pricing model, describing the elements of the different test stages.

- **Benefits and cost effectiveness of the recommendations**

The report provides a number of recommendations that can help to harmonize the procedures for Technical accreditation of EETS Providers in toll domains and enable more cooperation between Toll Chargers in setting up clusters and common test sites. Reducing the complexity of technical accreditation significantly reduces effort and cost for EETS Providers of becoming approved for toll charging in the respective toll domains. In fact, lengthy and cost-intensive are one of the most critical aspects for the further development of EETS.

3.3 Conclusions

The analysis of existing registration and technical accreditation procedures for EETS Providers in the REETS toll domains showed a diversified situation in the REETS Member States and toll domains. The report provides a number of recommendations which further define and also harmonize these procedures. That would reduce effort for EETS Providers to become initially registered and accredited in the various toll domains. Also Toll Chargers would benefit of closer cooperation between them, e.g. in setting up common test sites. The success of EETS significantly will depend on creating and maintaining effective and efficient registration and accreditation procedures.

4 Activity 3: Results and Benefits of the Analysis

4.1 Scope and Objectives

Art II.2.3 of EC Funding Decision defined the scope and objectives of Activity 3 as follows:

Activity 3 focuses on defining a set of Key Performance Indicators (KPIs) that are either common to both or specific to the different technologies allowed by the EC decision on EETS. It also focused on recommending practical measurement methods for the KPIs.

The activity analyzed the different KPIs for the EETS operations, and considered possible differences between DSRC and GNSS technology which would give rise to KPIs specific to each technology.

KPIs have been defined which can be applied independently of the charging system technology deployed in the Toll Domain, as well as additional KPIs that can be deployed specifically for Toll Domains using DSRC-based systems or GNSS-based systems. The resulting KPI definitions are published as a toolbox, which contains the basic elements of KPI definitions to a common level. This provides the basis for SLAs (Service Level Agreements) that are part of the contracts between Toll Chargers and SPs. Individual values for KPI thresholds were not decided and will be subject to negotiations and local characteristics within bilateral negotiation of detailed SLAs between Toll Chargers and SPs.

The Toolbox includes suggestions for mitigating actions which could be considered in the case of the required performance not being fulfilled by either the Toll Charger or the EETS-Provider as applicable.

The project also focused on creating awareness of the measurement methods for EETS relevant KPIs. In the second deliverable, guidelines are presented for how variables used within the recommended KPIs could be measured as well as a suggested method to determine the variables. The adoption of a harmonized approach to processes or methods for monitoring of KPIs will help reduce the complexity of operation of EETS. For the calculation of KPIs, a precise definition of the method is required on how to obtain the values of variable required by the KPI formula.

4.2 Findings and recommendations

- **Description of topic and the related barriers**

Activity 3 dealt with the definition (Deliverable D3.1) and description of the measurement methods (Deliverable D3.2) of the KPIs in order to ensure the quality of the EETS service between Service Providers (SP) and Toll Chargers (TC).

The goal was to produce a toolbox to reduce the effort and related costs of implementation of the KPIs.

The most significant barrier the project encountered within this activity, was the large variety and complexity of existing indicators, arising from different sources e.g. Toll Chargers, potential EETS providers, Stockholm Group report, current standards (ISO17444) etc.

In order to address this complexity, a selection process was developed in Activity 3, which mapped the existing KPIs used by Toll Chargers and EETS Providers, to the definitions proposed within the Stockholm Group report and the CEN standard ISO17444. In this way, it was possible to identify KPIs that were similar or addressing similar performance parameters and could therefore be combined under a single KPI definition, as well as any missing KPIs which were required based on the practical experience of Activity 3 participants.

Three important considerations have driven the selection of KPIs for the Toolbox:

1. Participants' needs and concerns have to be covered.
2. KPIs should use available statistically valid data without creating complexity to generate them.
3. The fewer the number of KPIs the better.

This selection has led to a final number of 11 KPIs and their corresponding calculation methods, distributed in 3 groups (see Recommendations bullet below). Also, a text on mitigation techniques when KPIs are not fulfilled has been included.

- **Main findings, recommendations and proposed measures**

KPIs should be used mainly for improving EETS service quality (contract penalties are not the objective of Activity 3 and have not been considered).

Practical considerations have driven the preparation of the deliverables D3.1 and D3.2.

A reduced list of KPIs (11) has been agreed between TC and potential EETS SP to ensure quality at minimized cost.

The following is the list of the recommended KPIs:

Technology independent KPIs:

These indicators will be used to monitor and improve:

- (1) the quality of the interface supporting the business processes, with regard to the timeliness and correctness of the files exchanged between SP and TC (for example: toll declarations, exception lists, etc.,...)
- (2) the payment delay;
- (3) the correctness of the OBE personalization data; and
- (4) the performance of TCs in supporting SPs inquiry process on user claims related to toll statements.

DSRC-related KPI:

The aim of this indicator is to monitor and improve the DSRC transaction quality between the antennas and the OBEs from any SP and will be applicable in multilane free-flow systems as well as in DSRC tolling systems with barriers.

KPIs for GNSS/CN systems:

These indicators will be used to monitor and improve:

- 1) the quality of a service with respect to the capture of all chargeable events of vehicles (within the responsibility of the SP in a Toll Domain);
- 2) same as above but for all segments that are passed in a Toll Domain;
- 3) the accuracy of 'measured usage' parameters for charging in a Toll Domain;
- 4) the service with respect to the declaration of false positive events of vehicles (within the responsibility of the SP in a Toll Domain); and
- 5) the DSRC performance of the Compliance Checking Communication function of the OBE.

- **Benefits and cost effectiveness of the recommendations**

The final purpose of the above recommended indicators is to improve the service quality and consequently the users' satisfaction and confidence, at minimized cost and effort (indicators to be used in the different Toll Domains across Europe, without the introduction of individual complex and therefore expensive measurement methods).

4.3 Conclusions

As required in Annex I of the Decision on the definition of the European Electronic Toll Service and its technical elements, Toll Domain Statements shall include Service Level Agreement (SLA) requirements, normally formulated as KPIs.

A reduced list of eleven KPIs covering the main business processes has been agreed between TC and potential EETS SP participating in the REETS project. The view of the participants is that this reduced list will ensure the ability to assure quality of service, but without excessive cost

5 Activity 4: Results and Benefits of the Analysis

5.1 Scope and Objectives

Art II.2.3 of EC Funding Decision defined the scope and objectives of Activity 4 as follows:

This activity focuses on the back office interfaces as well as security policies and the possibilities for their harmonization in order to ease the technical EETS implementation.

The work on back office interfaces is the harmonization of the interface content and processes (like exception lists or toll transaction exchanges, etc.) to the possible extent. It also aims to define concepts for a common interface test system, so to allow both EETS Providers and Toll Chargers to check their own back office interface systems before going into full-fledged suitability for use tests.

The activity analyzed the development of a common test and examination framework for back office interfaces suitable for the use in the DSRC and in the GNSS schemes, mainly based upon the EN ISO 12855 standard, as recommended in the Application Guide of the 2004/52 Directive.

On the security side, the ISO TS 16439 “EFC Security Framework” standard was considered as a suitable basis to analyze the security requirements and implementation choices for Toll Chargers and Service Providers. Agreeing on a common level of security elements is important to improve trust of all EETS stakeholders and to possibly simplify technical implementations and testing. The activity thus analyzed the individual security requirements of toll domains and tried to figure out potential harmonization of security requirements and consequent definition of a common set of security measures.

Finally, a third objective of WP4 was to provide input to the CEN work item on further specification of the IAP for the EN ISO 12855 standard.

In order to proceed, Activity 4 has been divided into two sub-activities:

- 4.1 - Back Office Interfaces: dedicated to the possible harmonisation of the interface content and interface processes, possibly creating a concept for a common interface test system. Deliverable D4.1 has been created within this sub-activity.
- 4.2 - Security Policy: dedicated to the assessment of individual security requirements of toll domains a potential harmonisation of security requirements in order to identify a minimum set. Deliverable D4.2 and D4.3 have been created within this sub-activity.

5.2 Findings and recommendations

5.2.1 Topic 1: lack of uniformity in the language defined in the back office interface business processes

The platforms used to realize the data exchange between Toll Charger (TC) and Service Provider (SP) are part of the Interoperability Constituents as defined in the Decision 2009/750/CE. In spite of this fact, at this stage, there are no mandatory provisions from the EETS Decision for Technology Providers (TP), Toll Chargers (TC) and Service Providers (SP) about which reference standard are to used, Implementations deployed before the publication of the Directive 2004/52/CE and Decision 2009/750/CE show data exchanges based upon platforms mainly based on bilateral agreements.

- **Main findings, recommendations and proposed measures**

A need was identified among all participants for a clear reference to a technical document, and the EN ISO 12855 standard was considered as the most suitable one. The majority of TCs already apply or intend to apply EN ISO 12855. Harmonization can be reached by defining a common REETS profile of EN ISO 12855 to be used by all the stakeholders. Among the participant TCs, there is a common approach for the definition of business processes and data in the different scenarios. This fact can be considered as a valuable input for the already on going standardization activities related to the definition of Interoperable Application Profiles (IAP). Several TCs required and foresaw additional information exchanges beyond those already defined in EN ISO 12855, so raising proposals for a future version of the standard. It was consequently agreed that:

- The development of the IAP of EN ISO 12855 should be progressed in order to reduce the number of variants in the implementation of EN ISO 12855. Furthermore, not only the message types and data elements should be covered in the profile, but also message sequences to cover underlying business processes. This would lead to reduce the number of possible interpretations of data exchange.
- In addition to the IAP, conformance test standards limited to the test syntax and format of data exchanges only are recommended to be developed also.

- **Benefits and cost effectiveness of the recommendations**

The main benefits of the previous recommendations are related to a possible reduction of costs for the implementation and for the certification phase; nonetheless, this is an advantage for the prevention of proliferating platforms based upon customizations.

5.2.2 Topic 2: lack of an agreement for a common definition of a REETS security policy in the end-to-end process

There is no a single definition of Security Policy, and this was one of the first obstacles the activity had to override. A security policy, in fact, aims at providing management directions and support for information security in accordance to business requirements and relevant laws and regulations at EU and national level. The adopted definition in the WP4 for Security Policy is “a set of requirements and applicable countermeasures specified by the party responsible for the security in a system exposed to threats. These countermeasures are based upon a risk analysis of the system in order to protect those data exposed to threats in the relationships between TC and SP”.

This definition led to consider the REETS Security Policy as a consequence of the analysis of the state of the art in the participating Toll Domains in terms of:

- Security Objectives;
- Security environments (TC, SP, User, External entity, Interoperability Management);
- Security requirements by classes (Information Security Management System, Communication Interfaces, Data Storage, TC, SP, User, IM);
- Countermeasures to be adopted;

The security policy described in D4.3 covers the aspects of information security in the REETS environment of all involved EFC systems, TCs and SPs. This policy applies to the information and communication assets of the REETS parties. This policy applies to organizations and their subcontractors that are part of REETS. D4.3 contains this approach with a security policy adopted from a policy originally developed in the Stockholm group (Report EETS SECURITY POLICY, V1.2, 07 September 2012) and then further elaborated for the EasyGo project (EasyGo security policy, V1.0, 28 August 2013). Some other contexts (like TIS-PL, VIA-T, Autostrade per l'Italia) have been analysed as well, taking into account their existing security policy.

- **Main findings, recommendations and proposed measures** The overall target of the security policy is summarized by the four security objectives listed below:

[SO-1] REETS toll data exchanged between TC and SP shall fall under the REETS security rules;

[SO-2] REETS toll data shall be correct, complete, traceable and protected;

[SO-3] Risk and efficiency should be considered when implementing security in REETS;

[SO-4] REETS security requirements shall be limited to support interoperability between the involved actors

The security policy contains policy statements on how it is intended to protect information in REETS. 21 policy statements have been then derived in order to define in more detail how it is intended to protect information in REETS. These policy statements cover:

- general aspects
- organizational issues
- asset and interface management
- incident management.

The security policy is a way of assuring the confidentiality, integrity and availability of assets in the REETS and its information and communication architecture and infrastructure for the benefit of the service users and the TC`s and SP`s participating in REETS.

Therefore, for a robust definition, organization, assessment, and management of REETS security policy the main results coming from D4.3 are the following:

1. Common Security requirements have been identified. They should be taken into account in the standardization work in order to be possibly identified and inserted in a profile called REETS profile.
2. The standard CEN ISO TS 19299 (upcoming version of EN ISO 16439), which was taken as a base for the security related issues, indicates which measures (techniques, algorithms, data exchanges) are to be taken if a specific security requirement is chosen. The security measures adopted by REETS are those that the standard prescribes.

Recommendations for further work and the EFC Security Framework:

1. Most of the relevant standards, especially the EFC Security Framework have been in revision process during the writing of the current document. It is therefore recommended to review the results in the current document that are based on the EFC Security Framework after the new version of it, i.e. CEN ISO TS 19299, has been adopted.
2. A REETS ICS (Implementation Conformance Statement) pro-forma statement based on ICS of CEN ISO TS 19299 applied to the REETS common set of requirements including the applicable security measures should be developed. This REETS ICS shall be used to check the security implementation according to the security conformance test process for SPs provided in the REETS deliverable D2.3 "Technical accreditation of EETS Providers in a toll domain".

3. The common set of REETS requirements provided in Chapter 5 of D4.3 is to be included in CEN ISO 19299 in an informative annex as the “REETS requirements profile”.
4. The REETS WP5 takes over the results of the work done by WP4 in order to define the rules to be followed by the Interoperability Management with regards to the development and maintenance work in the Security Policy framework.

- **Benefits and cost effectiveness of the recommendations**

The selection of security requirements and measures based on the guiding principles of the security policy and a risk analysis can be considered as basis for a REETS security implementation.

Then, the detected requirements are to be considered a guideline to EETS Providers and Toll Chargers during the implementation phase of the system for the application of the security policy in terms of model identification, interface implementation and check for the compliance.

5.3 Conclusions

5.3.1 BO Interfaces

To achieve the WP4 objectives related to the back office interfaces, the provisions of the standard EN ISO 12855 have been taken as the basis for assessing the current state of the on-going and/or planned implementation of back office interfaces within the toll contexts of the participating TCs. The following main results and conclusions have been found:

1. Communication over the TCs defined back office interfaces is still heterogeneous. At the current state of art, the SPs have had to adapt to the requirements of Toll Domains (or Cluster of Toll Domains) and this resulted in different implementations, but functional consistency exists between the back office interfaces put in place by the participating Toll Chargers and Toll Service Providers.
2. EN ISO 12855 is a toolbox that can be used as a functional framework for the actors for consistency in the development of interfaces and back office platforms. The business processes described in D4.1 should be the reference for future implementation, at least within the borders of the pilot project (REETS). This approach should pave the way when enlarging the playground to the entire EU for the future development of the EETS.

3. Due to the individual EFC system definitions and requirements, the implementation for REETS and EETS may be complex for Service Providers. However, thanks to a cluster approach (like EasyGo, TIS PL, VIA-T, Telepass), unique specifications have been implemented for several decades of Toll Chargers and several SP. GNSS/CN based systems deserve special attention for their peculiar business model and its possible proliferation of diverging solutions for the definition of the tolling schemes. In particular, there are more different allocations of responsibilities between partners involved in business processes than in DSRC based systems. In order to bring forward the implementation of REETS and EETS, the possibility of harmonization of GNSS/CN tolling scheme types (with special regards of upcoming schemes) and system requirements should be checked.
4. The Interoperable Application Profile (IAP) for EN ISO 12855 per type of Toll Context (DSRC context, GNSS Context) would contribute to facilitate this step for the future development of the EETS to the entire EU. Moreover it should limit the options of the base standard to be used in an interoperable EFC cluster based on the similarities of existing and planned EETS back office interfaces of the EFC systems as shown in this document.
5. In addition to the IAP, at this stage an IAP conformance test standard limited to the test syntax and format of exchanged data is also recommended.

5.3.2 Security Policy

For what concerns the Security Policy, the definition given in WP4 shall support the REETS project among others especially:

- When explaining and discussing security issues with management or with less security technical oriented project members;
- In order to achieve consensus and/or when security decisions in the REETS environment are required.

An important element is the "common set of REETS security requirements" provided in chapter 5 of D4.3, agreed among REETS participants. This set of requirements has been selected from those provided in the standard CEN TS 16439 - EFC security framework. The resulting set of requirements in the current document should be used as guidance during the REETS implementation phase, by both the TCs and SP.

Final remarks

The results of work packages 2, 3 and 4 have underlined the great deal of technical components and aspects to be addressed in order to effectively implement the EETS. All the technical elements analyzed throughout the project establish the basis for moving to the testing/deployment phase.