



CESARE III PROJECT

Interoperability of electronic fee collection systems in Europe

D5.1 - LIST OF RELEVANT PROCEDURES FOR INTEROPERABILITY

Document version	Final
Document status	Validated by project Steering Committee
File name	D5.1 - List of relevant procedures for interoperability - 9 October 2006 - Final.doc
Dissemination level	EC
Date	9 October 2006



PROJECT CO-FUNDED BY THE EUROPEAN COMMISSION: DG TREN



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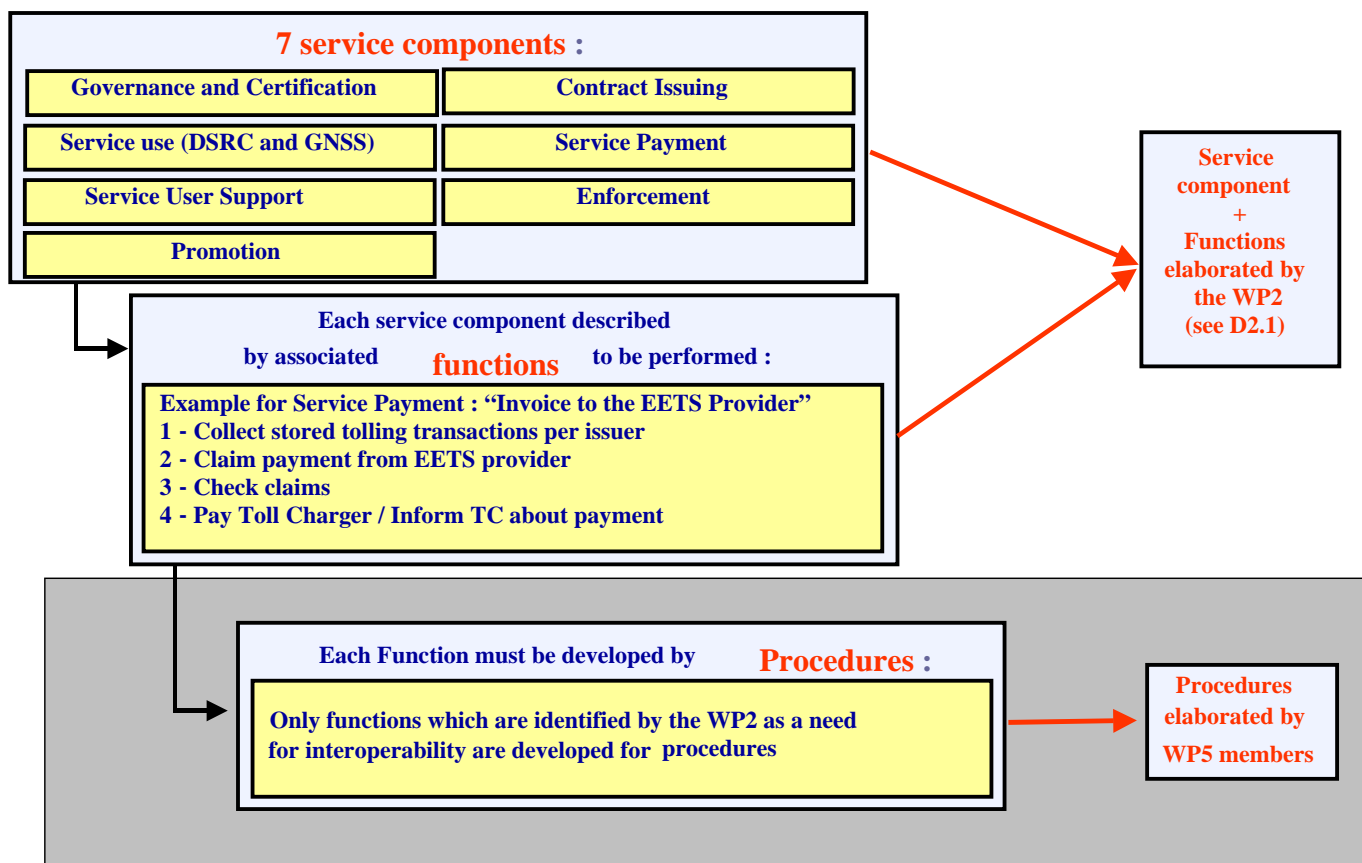
1. Purpose of the document

The WP2 has defined the core of the EETS service in the deliverable D2.1. The service is structured into 7 service components :

- Governance and Certification
- Service Use on toll roads
- Contract Issuing
- Service Payment
- Service User Support
- Enforcement
- Promotion

Each service component is described with some functions which are developed in the D2.1 and qualified as a need for the interoperability or not. Based on this work, the WP5 identifies, per function, the associated procedures. It's important to point out that only functions which are needed for interoperability are developed into procedures.

The diagram hereafter shows this elaboration process :





This WP5 deliverable is based on the service components as defined in the D2.1. Each service component is defined by :

- The table defined in the D2.1 which presents related functions and qualifies them as a need for interoperability or not. Involved roles are specified as “TC” for toll Charger, “EP” for EETS Provider, “IM” for Interoperability Manager and “US” for User.
- An activity diagrams that shows the functions split down to procedures including which entity being responsible for the procedures. The different diagrams have different levels of detailing reflecting the different levels of complexity and different level of description in 2.1.
- A table which presents the related procedures for each qualified function needed for interoperability. These functions are described with the following columns :
 - **Quality requirement:** a requirement used for deciding whether a function or sub-function has been successfully completed
 - **Actors involved:** describing the main roles involved in the function or sub-function and defining the role in charge of the function or sub-function completion
 - **Initialisation and finalisation event:** which external event initiates the function or sub-function and which internal event finalises the function or sub-function
 - **Activities included:** activities included and whether any of the activities included should be harmonised within EETS
 - **Data elements/messages format:** whether any data element or message format could be freely chosen, agreed by bilateral agreements or harmonised throughout EETS
 - **Communication:** whether the communication could be agreed by bilateral agreements or harmonised throughout EETS
 - **Time and frequency:** whether the function or sub-function could be carried through at any time and as often the operator decides or whether there are any restrictions or requirements throughout EETS
 - **Security measures:** whether there are any security measures that should be agreed by bilateral agreements or harmonised throughout EETS
 - **How to handle errors and failures:** whether there are any specific procedures or requirements that should be agreed by bilateral agreements or harmonised throughout EETS



2. List of relevant procedures for interoperability

Warning: in the present chapter, the word "User" is used as a synonym of "Service User"

2.1 Governance and Certification

2.1.1 Functions and interoperability needs as defined in the WP2 – D2.1

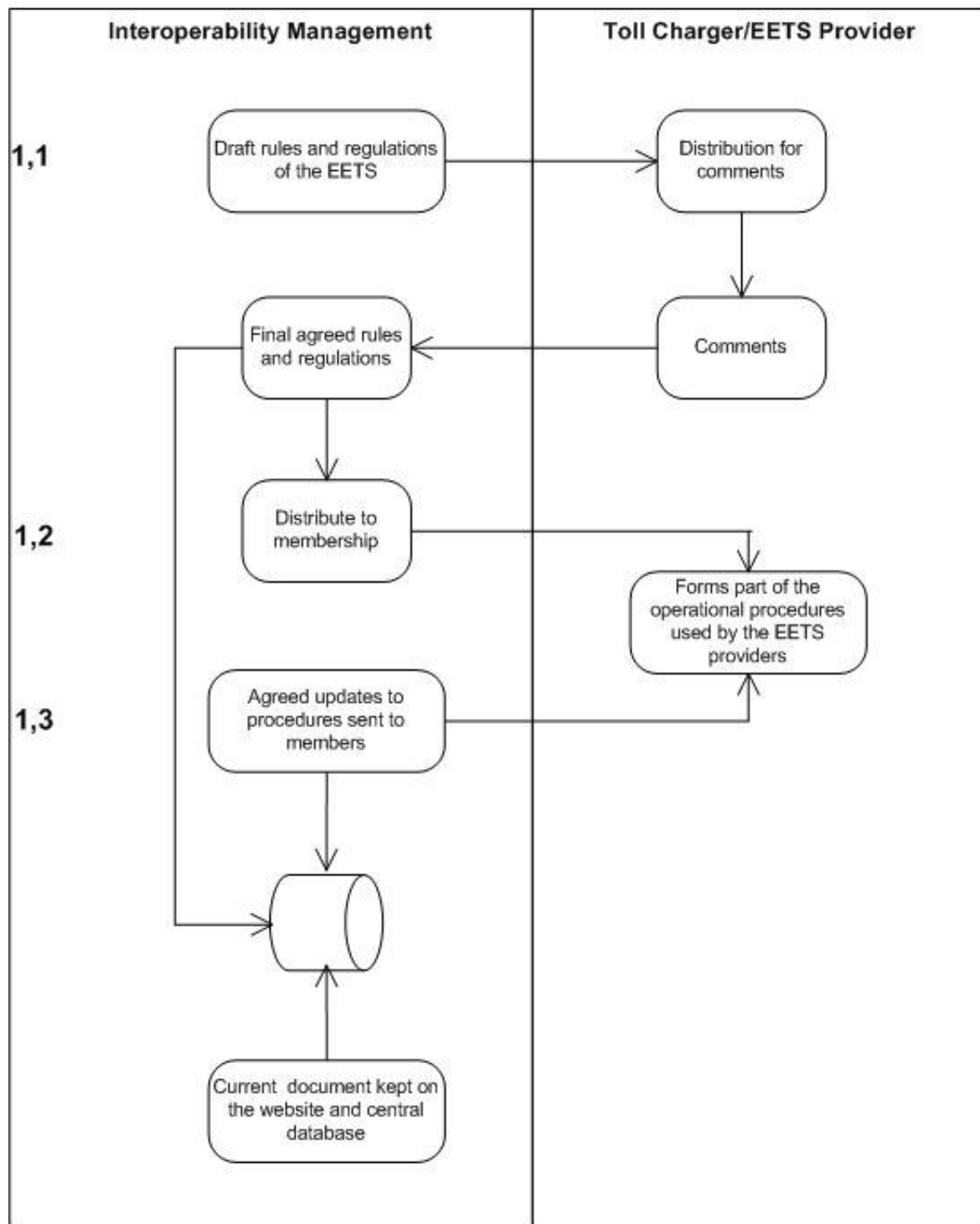
EETS Service Component and Functions		Roles	Interoperability needs	
			YES	NO
Governance				
G1	Define and maintain the EETS Core Service Definitions, rules and regulations required for interoperability.	IM	×	
G2	Define the rules to settle disputes between members (Arbitration).	IM	×	
G3	Maintain and issue the authoritative list of contracting parties (EETS Providers and Toll Chargers).	IM	×	
G4	Define and maintain procedures for the distribution of certified equipment and/or its software.	IM	×	
G5	Ongoing audit review of OBE/RSE/CS compliance.	IM	×	
G6	Operate and maintain the common organization.	IM	×	
G7	Define, maintain and issue, if necessary, model standard contracts for co-operation between actors.	IM	×	
G8	Define and maintain ID-schemes and, if necessary, support the issuing of IDs.	IM	×	
Certification				
C1	Define and maintain the EETS Test and Certification policy.	IM	×	
C2	Define and maintain the Test documents (test standards, test specifications etc).	IM	×	
C3	Manage the certification organization and processes involved.	IM	×	



2.1.2 Procedure diagram

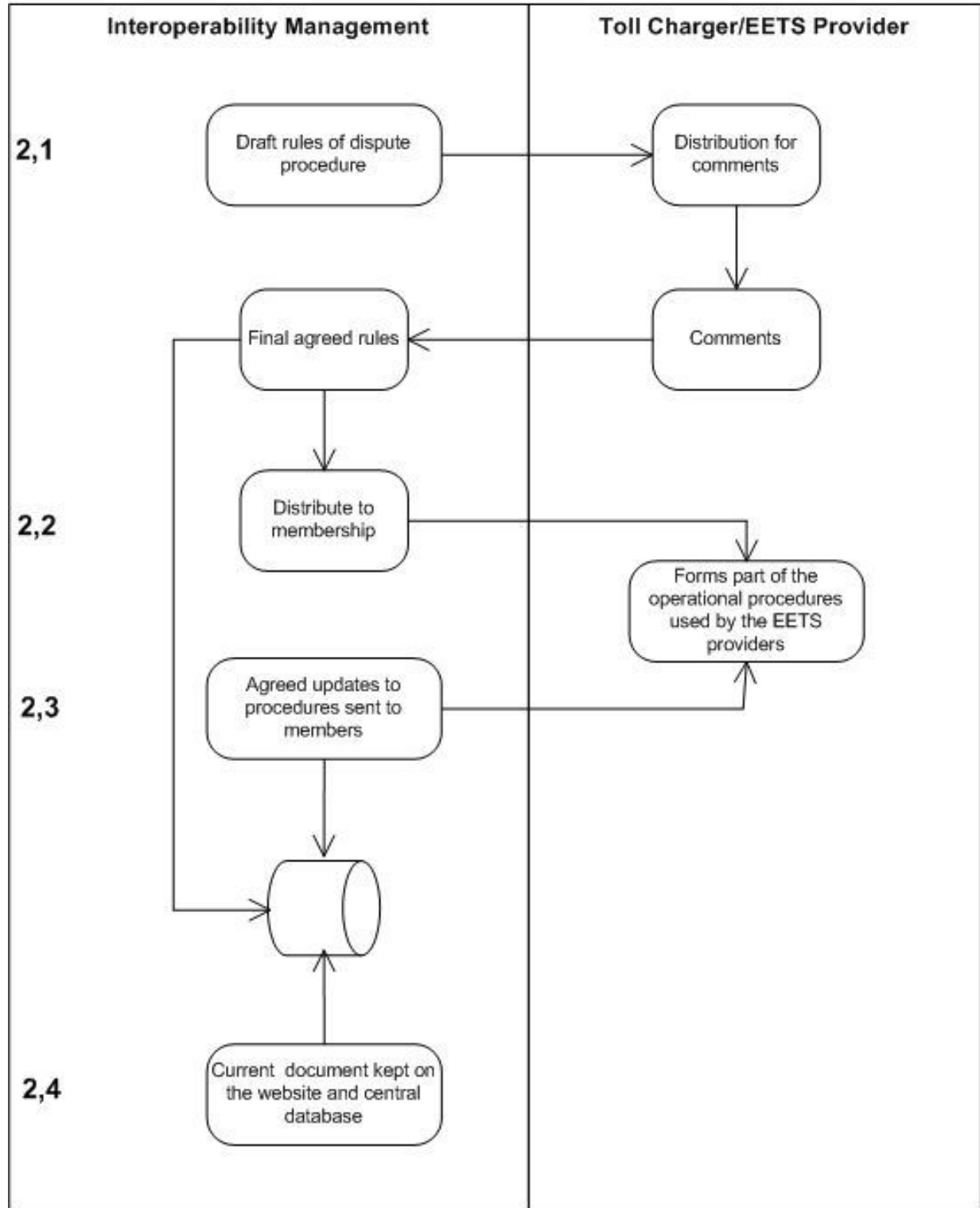
Governance diagrams

G1 - Define and maintain the EETS Core Service Definitions, rules and regulations required for interoperability.



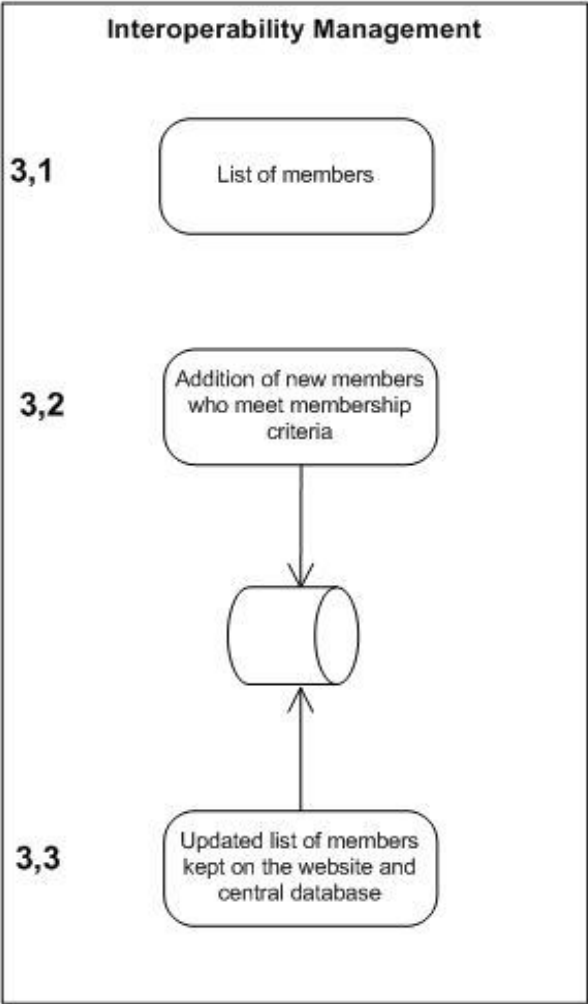


G2 - Define the rules to settle disputes between members (Arbitration).



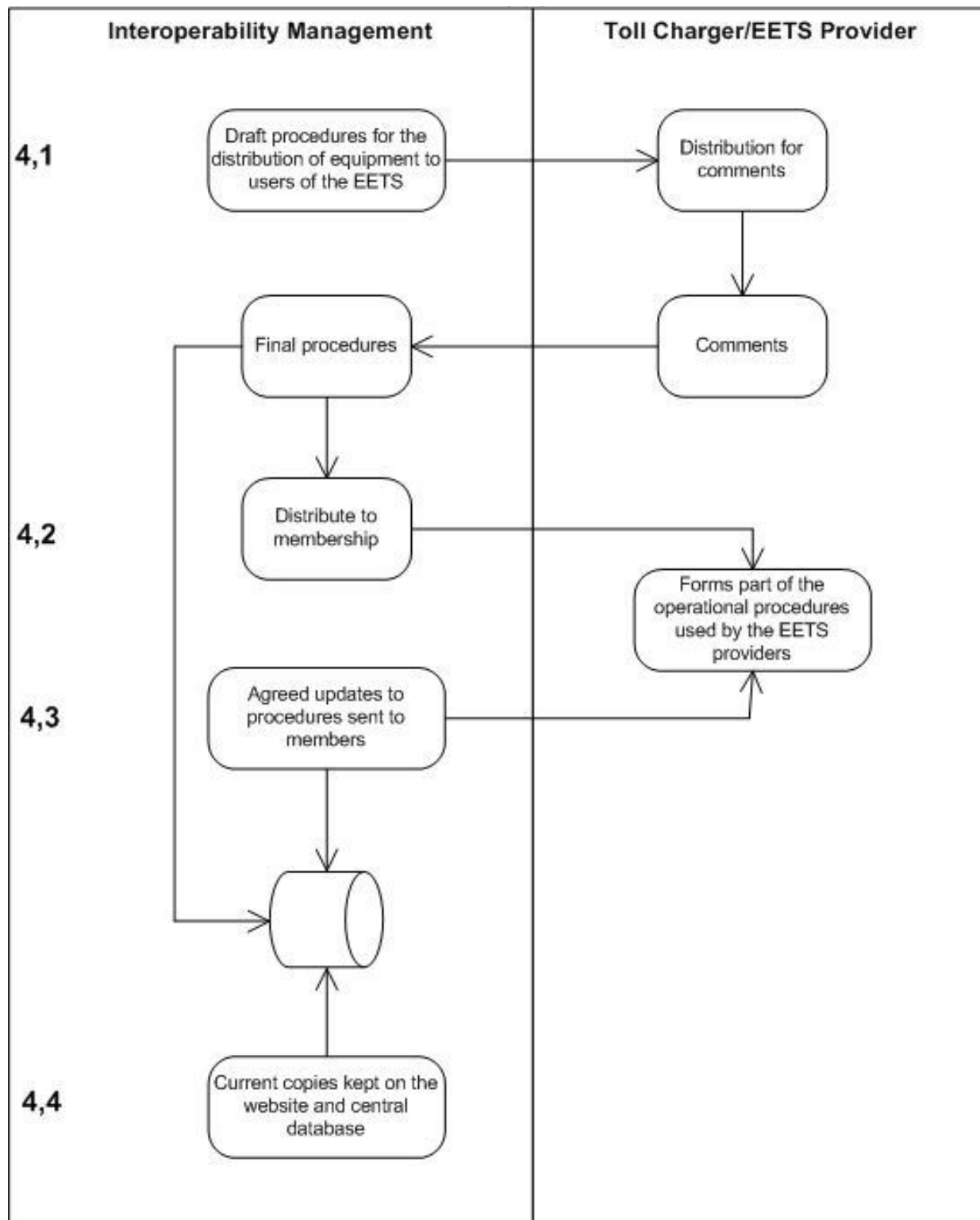


G3 - Maintain and issue the authoritative list of contracting parties (EETS Providers and Toll Chargers).



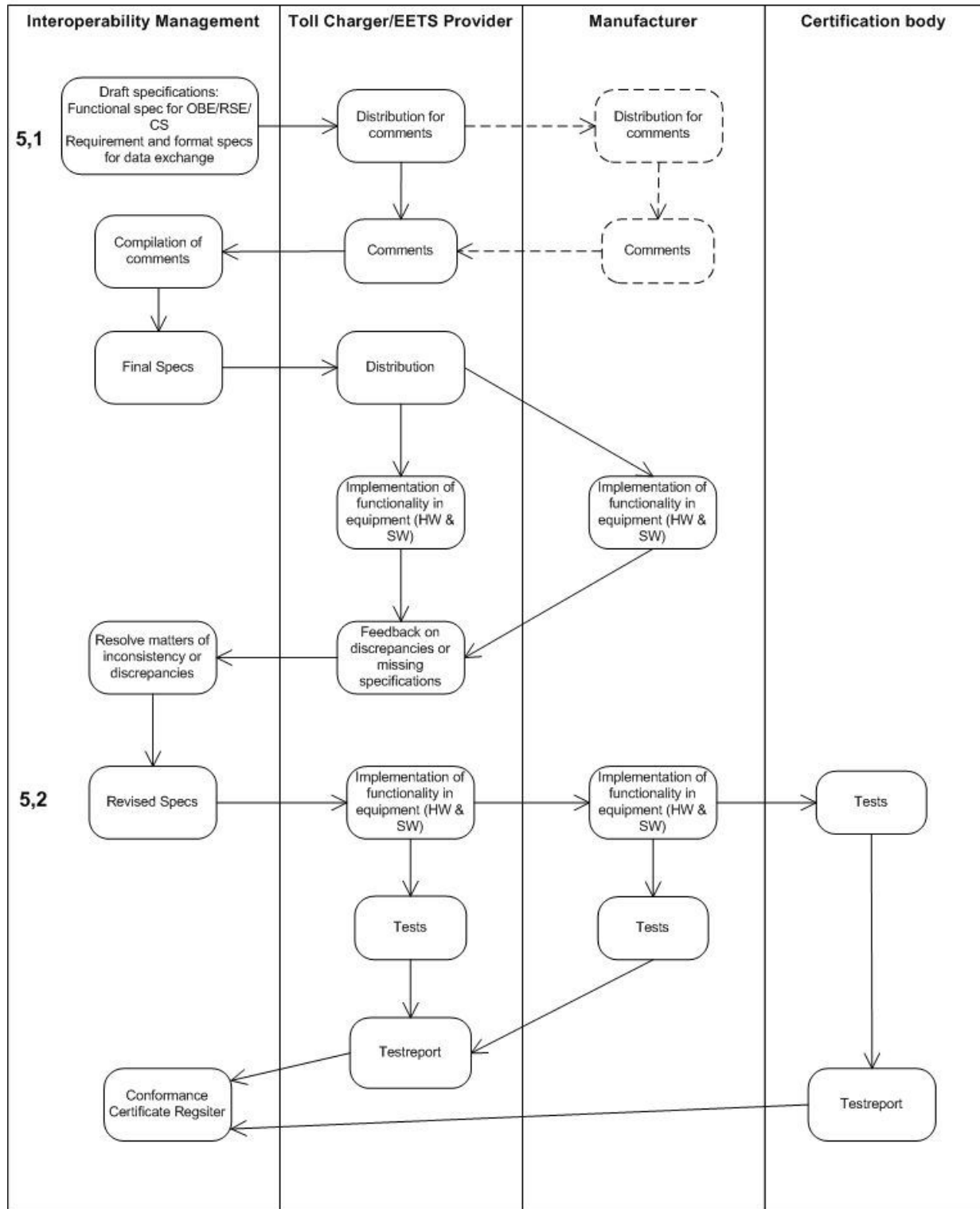


G4 - Define and maintain procedures for the distribution of certified equipment and/or its software.



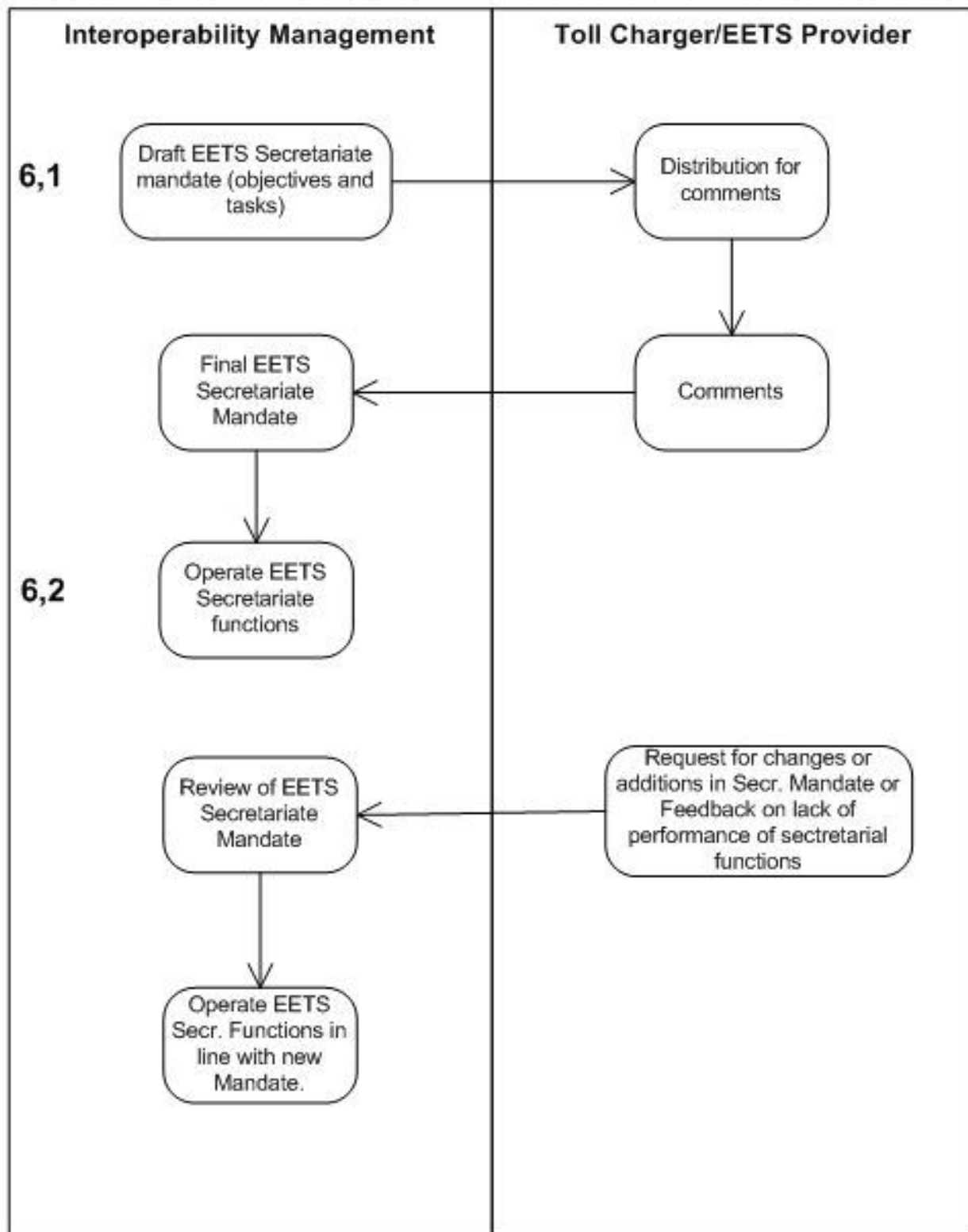


G5 - Ongoing audit review of OBE/RSE/CS compliance.



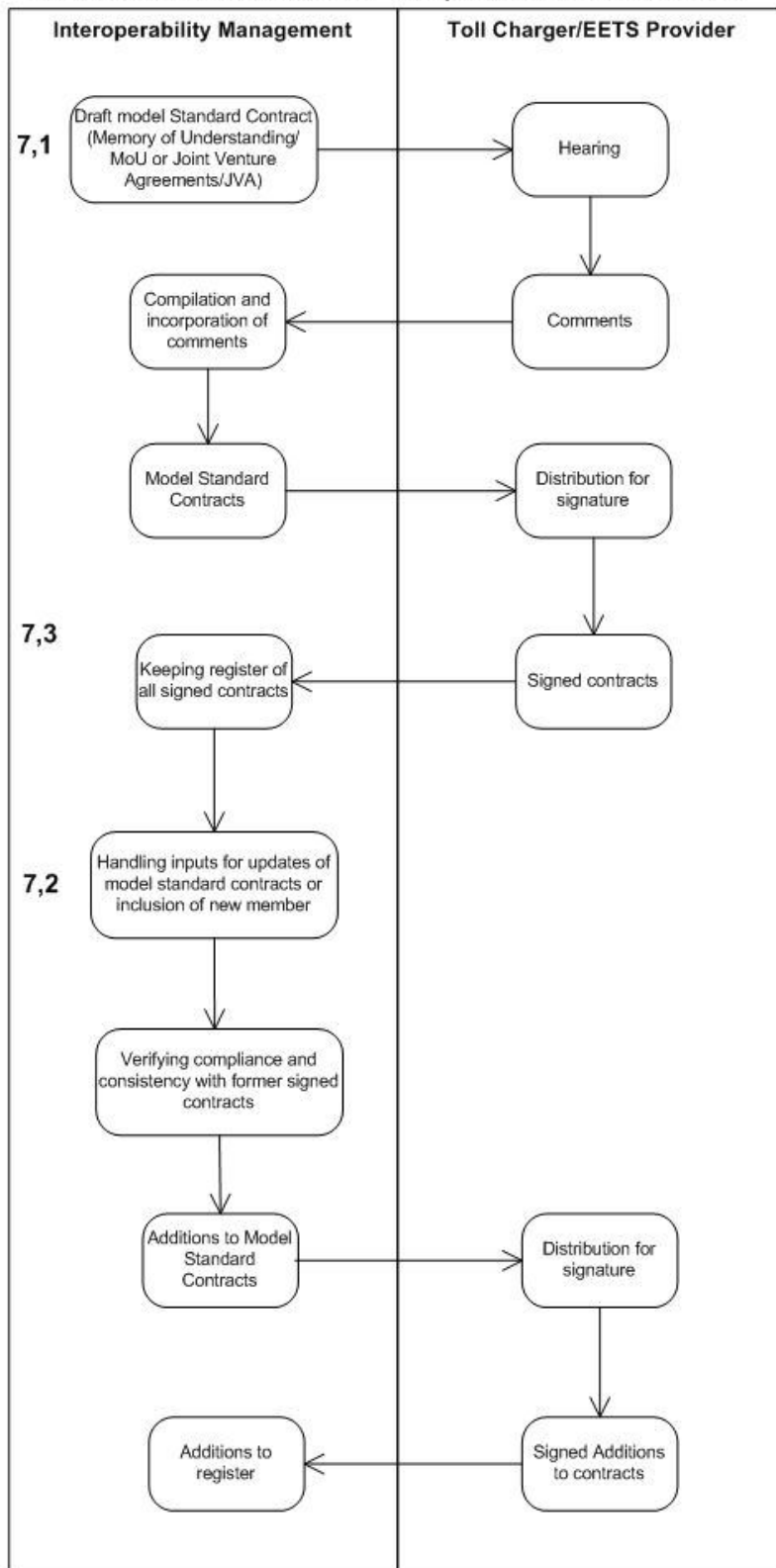


G6 - Operate and maintain the common organization.



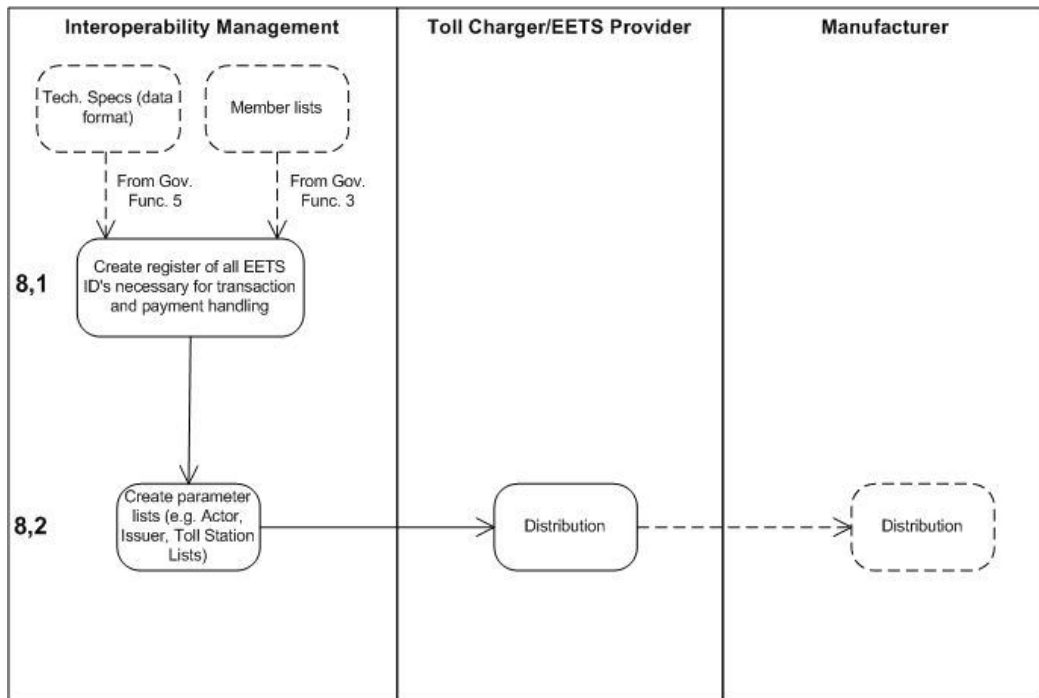


G7 - Define, maintain and issue, if necessary, model standard contracts for co-operation between actors.



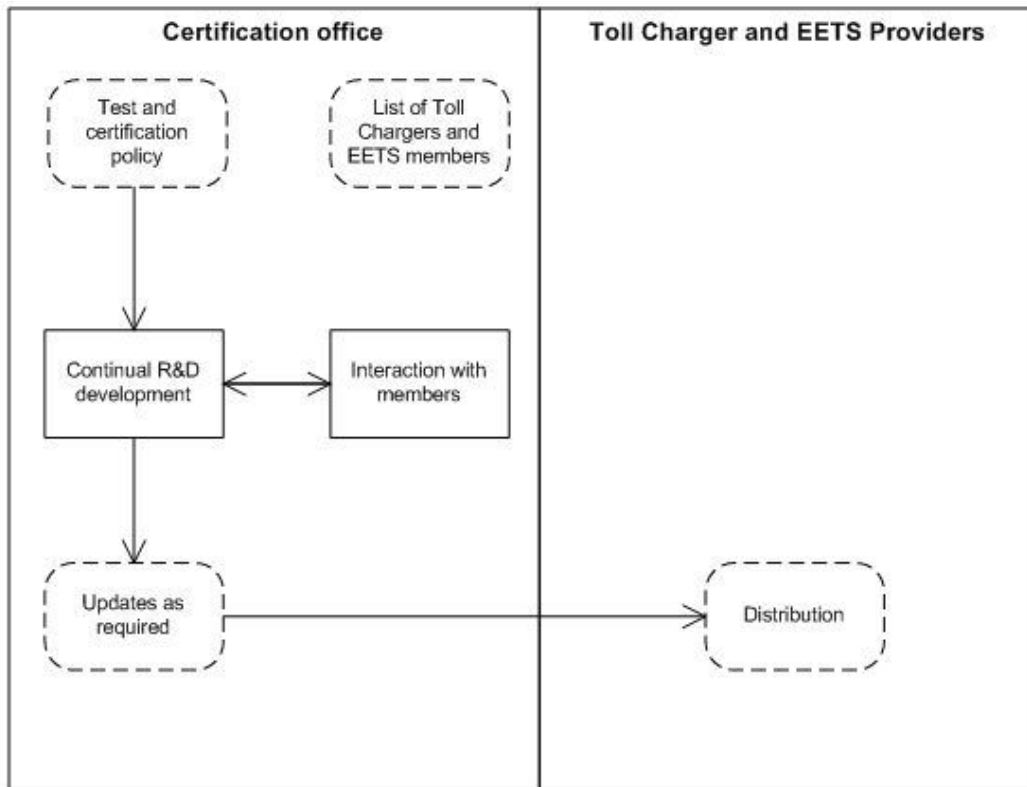


G8 - Define and maintain ID-schemes and, if necessary, support the issuing of IDs.



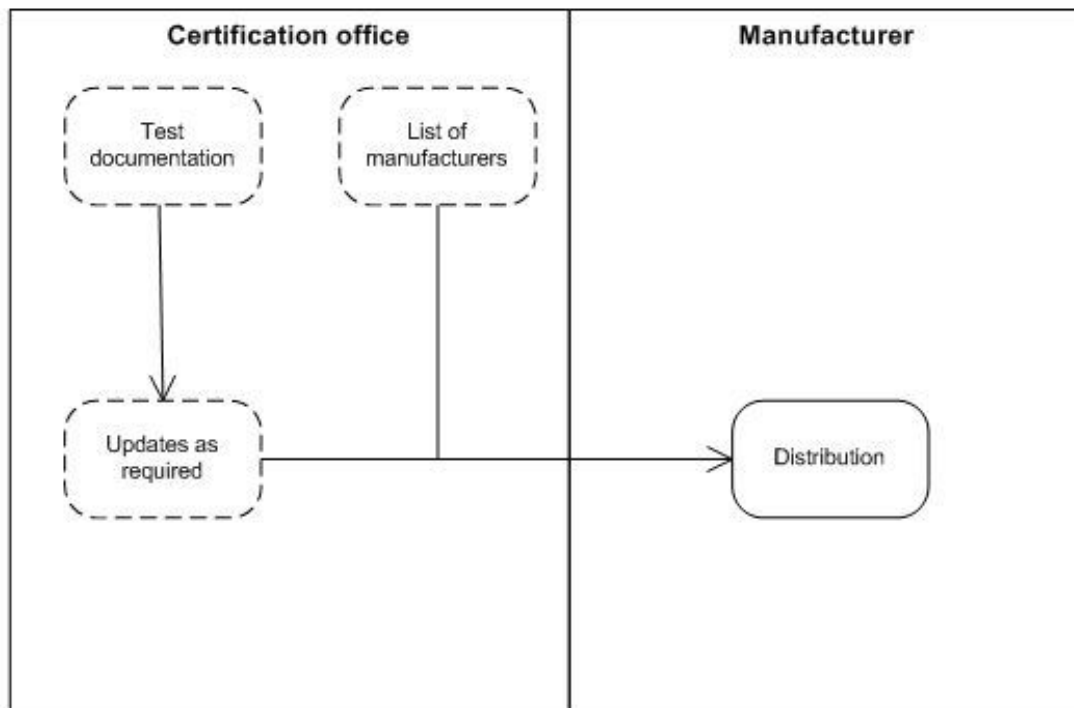
Certification diagrams

C1 - Define and maintain the EETS Test and Certification policy.

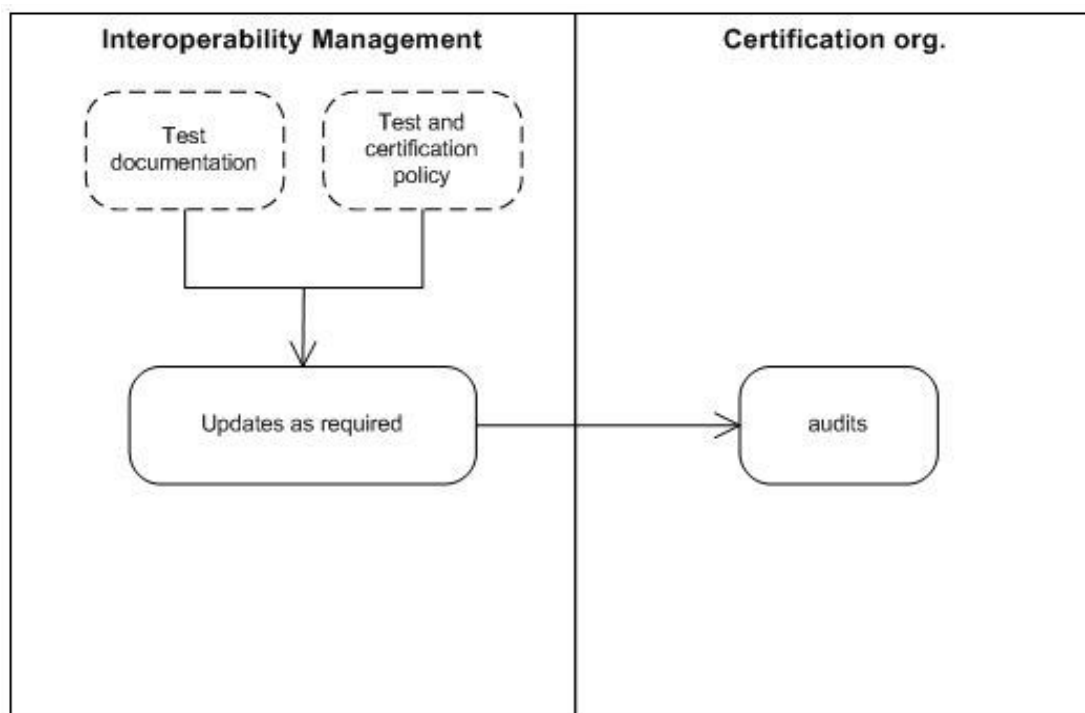




C2 - Define and maintain the Test documents (test standards, test specifications etc).



C3 - Manage the certification organization and processes involved.





2.1.3 Description of the related procedures

GOVERNANCE	Procedures	Main objective	Quality requirements	Actors involved	Initialisation event	Finalisation event	Activities included	Data elements / messages format	Communication	Time and frequency	Security measures	How to handle errors and failures
G1 - Define and maintain EETS Core service definitions	1.1 Draft rules and regulations	To obtain common agreement as to the contents of the standard document governing the relationship between the Toll Chargers and EETS Providers	Clarity of the terms and conditions between the parties	Interoperability Management, Toll Chargers and EETS Providers	Membership asked to comment on draft document contents	Comments received and agreement on their disposition	See activity diagram.	Draft legal Boilerplate document	Individually	Individually		Areas of non-agreement on identified T&C's agreed by committee for resolution
	1.2 Incorporate mutually agreed comments and suggestions into the final initial standard Boilerplate document	Maximise the "Buy-in" of the members to the SOP.	Clarity of the terms and conditions between the parties	Interoperability Management, Toll Chargers and EETS Providers	Membership circulated with final Boilerplate document	Membership agree and sign the document for concurrence	See activity diagram.	Standard Boilerplate	Individually	Individually	Agreed Boilerplate integrity maintained through normal "Normal Change control" procedures	Copy of signed documents kept in central file of the Interoperability Management
	1.3 Update the standard document as required from time to time	To reflect changes in the business environment	Clarity of the terms and conditions between the parties	Interoperability Management, Toll Chargers and EETS Providers	Suggestions for changes circulated amongst members	Membership confirm acceptance	See activity diagram.	Standard Boilerplate	Individually	Individually	Agreed Boilerplate integrity maintained through normal "Normal Change control" procedures	
G2 - Define the rules to settle disputes amongst members	2.1 Define the procedures to be followed	Guidance to members on how to approach settlement of disputes with other members	Clarity of the terms and conditions on how to pursue dispute settlement	Interoperability Management, Toll Chargers and EETS Providers	Membership asked to comment on draft document contents	Comments received and agreement on their disposition	See activity diagram.	Draft procedural document	Individually	Individually	n/a	
	2.2 Handling of dispute	Resolution of the dispute in a timely manner	Clear understanding of the area of dispute	Interoperability Management and the Toll Chargers and/or EETS Providers involved in the dispute	Central awareness of the dispute	Resolution of the dispute	See activity diagram.	Standard procedure to be followed	Individually	Individually	Confidentiality of dispute between the related parties	Court of Arbitration
G3 - Maintain and update the authoritative list of contracting parties	3.1 Initialization and the ongoing update of the list	Each member is aware of all the parties to the EETS system	List is kept current and is available to all parties	Interoperability Management, Toll Chargers and EETS Providers	The date upon which the EETS is formally started	Thereafter upon the addition of new members	See activity diagram.	Standard procedure to be followed	To all members	As required	n/a	



GOVERNANCE	Procedures	Main objective	Quality requirements	Actors involved	Initialisation event	Finalisation event	Activities included	Data elements / messages format	Communication	Time and frequency	Security measures	How to handle errors and failures
G4 - Define and maintain the procedures for the distribution of certified equipment and /or software	4.1 The procedures by which hardware and the related software is distributed to users by the EETS providers	To ensure that the distribution of the hardware and software is only issued under a proper controlled environment.	Only certified equipment and software is used and the users understand the manner under which it can be used.	Interoperability Management, EETS providers and their user base.	The date upon which the EETS is formally started	Ongoing	See activity diagram.	n/a	To all members	As required	n/a	
	5.1 Maintaining and updating of OBU/RSE/CS specifications	Define and update necessary EETS additional requirement specifications of relevant entities as OBE/RSE/CS	ISO standards for EFC/DSRC etc. "Keep it simple"	Interoperability Management, Manufacturers, EETS Providers, Toll Chargers	Draft specifications distributed for comments to EETS members, inkl. manufacturers		See activity diagram.	Technical specifications	To all	Prior to start of EETS co-operation and updates when necessary	EETS functionality should not compromise existing EFC functionality of member	
G5 - Ongoing audit review of OBE/RSE/CS compliance	5.2 Assurance of compliance tests following any specification update	To assure that compatibility tests (SC Certification) are undertaken and downward compatibility is maintained upon specification updates	Correspondence between updates of technical specifications and test procedures/ specifications.	Interoperability Management, Certification body, EETS Providers, Toll Chargers, Manufacturers	Any EETS member are changing or upgrading of OBU/RSE/CS equipment, or new member is included in the co-operation	Test reports from Certification body confirming compatibility/ interoperability of new equipment towards existing EETS equipment.	See activity diagram.	Revised technical specifications. Test reports.	To concerned members, Manufacturers and Certification body.	Ongoing		
	6.1 Define objectives and tasks for common EETS Organisation	To clearly define and communicate role and responsibility of common EETS secretariate		Interoperability Management (secretariat), EETS Providers, Toll Chargers	Circulate draft EETS secretariate mandate document (responsibilities) to members	Upon reception of comments review and issue final EETS secretariat mandate and forward to all members		EETS secretariate mandate document.	To all	Prior to start of EETS co-operation and updates when necessary		
G6 - Operate and maintain the common organisation	6.2 Operate EETS Secretariate	Undertake and execute secretarial tasks according to defined rules and regulations		Interoperability Management (secretariat), EETS Providers, Toll Chargers	Start of EETS co-operation	Termination of EETS co-operation or failure to fulfill contractual obligations				Continuously	Following any integrity and confidentiality regulations of EETS	
	7.1 Draft MoU/JVA with appendixes for EETS co-operation actors	Define technical, legal, organisational and economical requirements that is to be agreed through MoU or JVA by the members	EU directives, fiscal and legal regulations of each country	Interoperability Management, EETS providers, Toll Chargers	Distribution of contract documents to members for comments	Compilation of comments and review of EETS contract documents	See activity diagram.	MoU, Joint Venture Agreement, EETS Provider Agreement or other contract documents	To all members	Prior to start of EETS co-operation and updates when necessary		
G7 - Define, maintain and issue, if necessary, model standard contracts for co-operation between actors	7.2 Develop and maintain EETS contract documents	To maintain and update standard model contracts among existing and new members of the EETS co-operation	New contract documents should not be in contradiction with former signed ones. Downward compatibility.	Interoperability Management, EETS providers, Toll Chargers	New members join the co-operation or directives, other legislation or changes should be reflected.	All members agree to the new contract documents after hearing	See activity diagram.	MoU, Joint Venture Agreement, EETS Provider Agreement or other contract documents	To all members, incl. New	Ongoing		
	7.3 Issue for signature and keep register of all EETS contract documents	To assure that all co-operating members sign all agreed contract documents, including updates of contract documents when new members join or changes are required	Agreed EETS document handling procedures	Interoperability Management, EETS providers, Toll Chargers	Issue documents and updates for signature	Reception of signed contracts and filing them in register	See activity diagram.	MoU, Joint Venture Agreement, EETS Provider Agreement or other contract documents	To all members, incl. New	When new contract documents are required	Question: Who are performing necessary controls that legal/economical requirements are met by an actor?	



GOVERNANCE	Procedures	Main objective	Quality requirements	Actors involved	Initialisation event	Finalisation event	Activities included	Data elements / messages format	Communication	Time and frequency	Security measures	How to handle errors and failures
G8 - Define and maintain ID-schemes and, if necessary, support the issuing of ID's	8.1 Maintain a register of Actor ID, Toll Station and Lane ID's	To assure unique ID's of all entities and data elements used in the transaction and payment handling between members	ISO 3166 (country code), ISO 14906 (BIN, context mark), ISO 14816 (AVI/AEI numbering scheme)	Interoperability Management, EETS providers, Toll Chargers	Technical Specifications defined under Service Component Governance 5 are issued setting requirements to ID numbering schemes		See activity diagram.	Actor list, Issuer list, Toll Station lists	EETS Providers, Toll Chargers, National Standards Organisations	Ongoing		
	8.2 Distribute lists of Actors and Toll Station identification to all members	To assure that all members have access to the latest update of parameter lists	Lists to be according to agreed specifications	Interoperability Management, EETS providers, Toll Chargers	At start-up of EETS or whenever a change in a list is registered		See activity diagram.	Actor list, Issuer list, Toll Station lists	To all	Upon changes		
CERTIFICATION	Procedures	Main objective	Quality requirements	Actors involved	Initialisation event	Finalisation event	Activities included	Data elements / messages format	Communication	Time and frequency	Security measures	How to handle errors and failures
C1 - Define and maintain the EETS Test and certification policy	1.1 Define and maintain rules and regulations	Allows all the existing and potential new manufacturers to understand the guidelines under which they must QA their equipment if they wish to provide their equipment to the EETS community	Clarity of the guidelines	Interoperability Management, Toll Chargers and EETS Providers	Membership asked to review and comment on the specification requirements	Comments received and agreement on their disposition	See activity diagram.	Issuance of the specifications	Individually	As and when the specification is updated under revision control		Communicate to the manufacturer with copy to the Certification office
C2 - Define and maintain the required test documents (test standards, test specifications, conformity declarations, etc.)	2.1 Document the test procedures to be followed	Common understanding of the specification, quality and functionality required of equipment to be used in the EETS environment	The test documentation covers all of the functional requirements together with their performance and MTBF	Interoperability Management and Equipment manufacturers	Issuance of the agreed test documentation	Ongoing with revision controls	See activity diagram.	Standard documentation	Individually	As and when the specification is updated under revision control		
C3 - Manage the certification organization and processes involved	3.1 Oversees the certification organization which may be an outsourced function.	Gives direction and guidance to third party certification bodies as to the manner in which they conduct their activities as regards the certification of third party manufacturers of EETS related equipment	Clarity of the guidance terms issued to the certification organization	Interoperability Management	Start of the EETS service	Ongoing	See activity diagram.	Standard documentation	Individually	Ad-hoc	Occasional audits of their work	



2.2 Contract Issuing

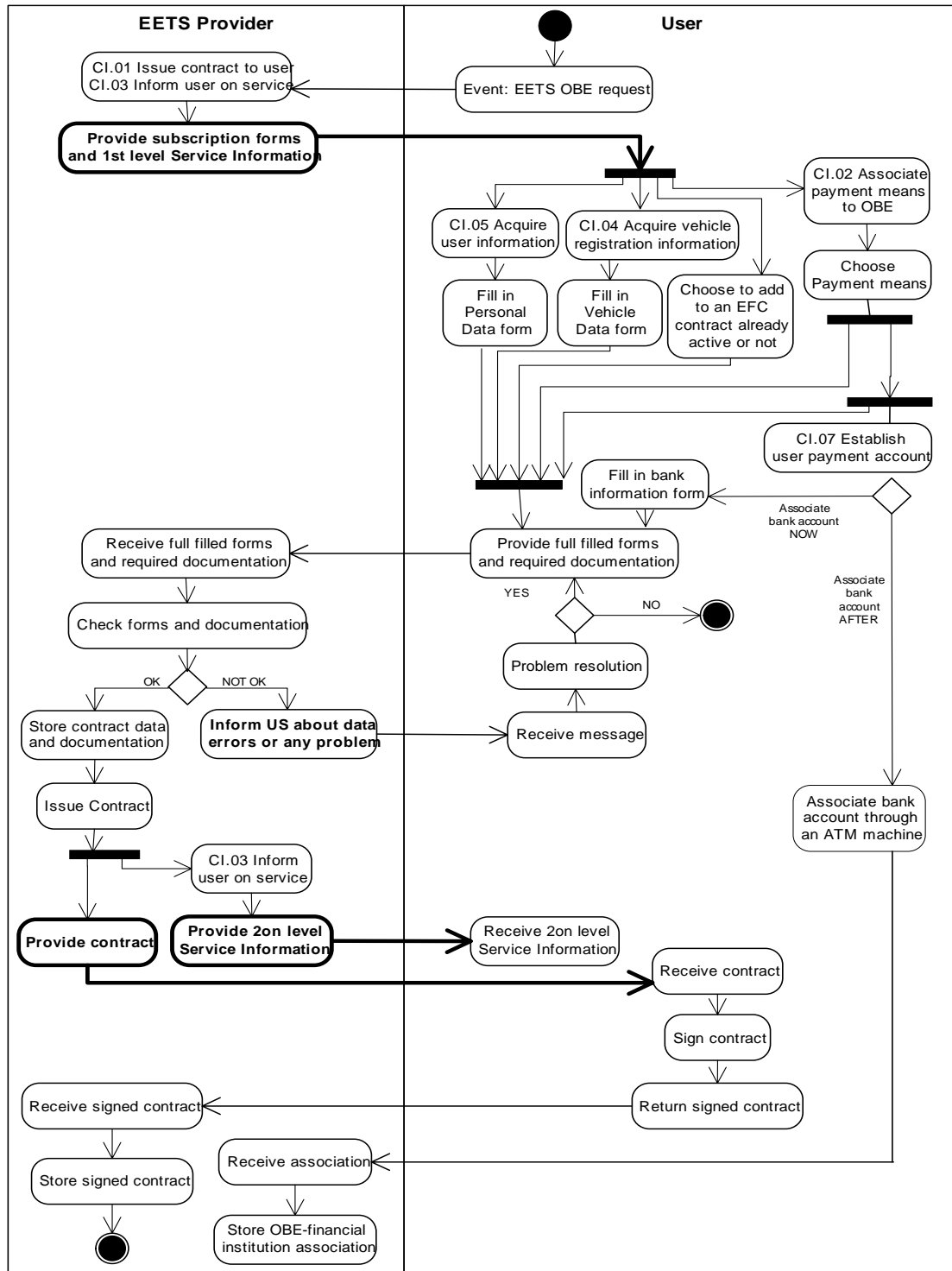
2.2.1 Interoperability needs as defined in the WP2 – D2.1

EETS SERVICE COMPONENT AND FUNCTIONS		Roles	Interoperability needs	
			YES	NO
CONTRACT ISSUING				
CI.01	Issue contract to User	EP	×	
CI.02	Associate payment means to OBE	US	×	
CI.03	Inform User on service	EP	×	
CI.04	Acquire vehicle registration information	EP	×	
CI.05	Acquire User information	EP	×	
CI.06	Establish User record (contract/OBE)	EP	×	
CI.07	Establish User payment account	EP	×	
CI.08	Personalise OBE	EP	×	
CI.09	Initial database in OBE (map, tariffs)	EP	×	
CI.10	Issue OBE to User	EP	×	
CI.11	Install and mount OBE	EP/US	×	



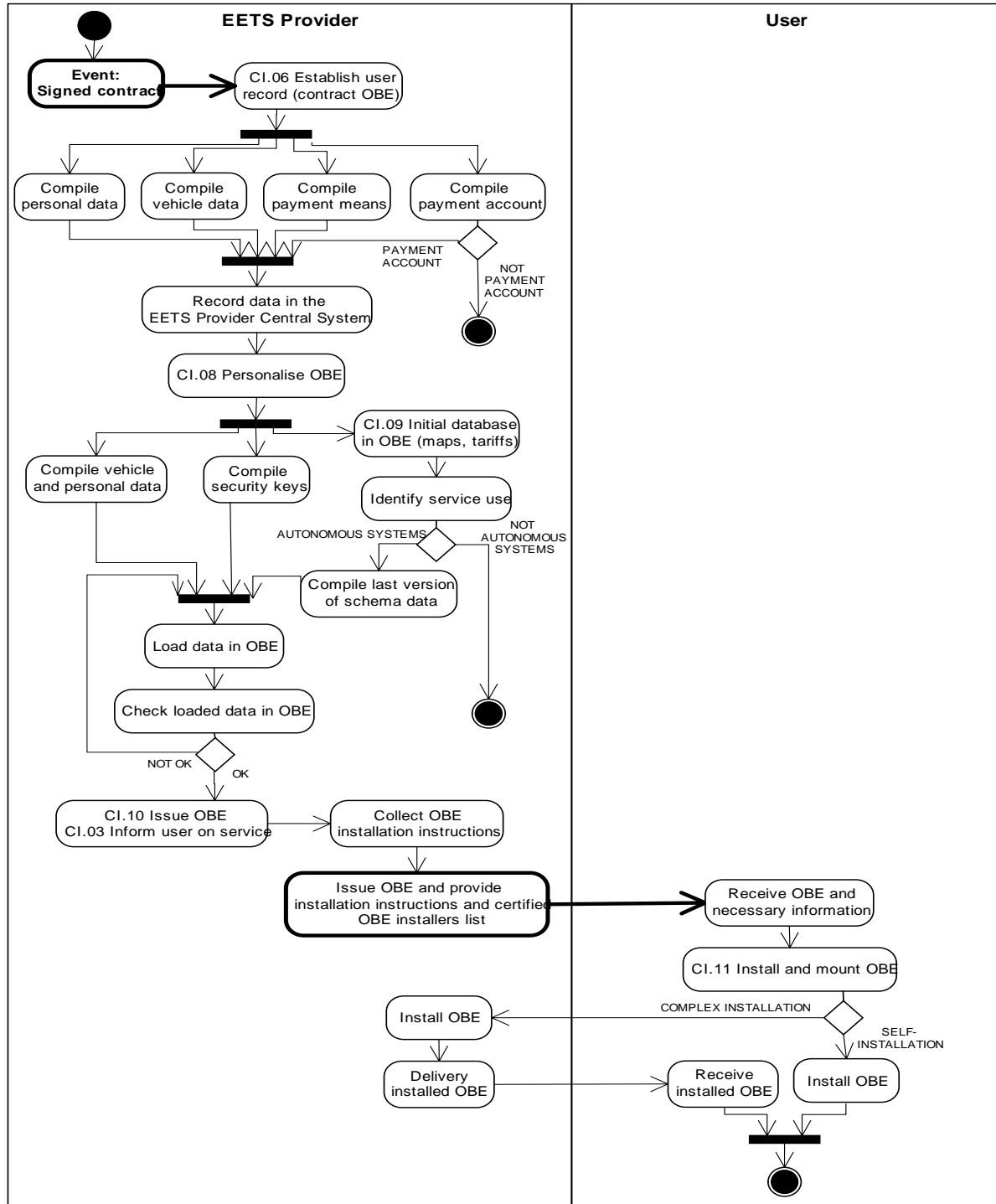
2.2.2 Procedure diagram

CI.01 - Issue contract to User / CI.02 - Associate payment means to OBE / CI.03 - Inform User on service / CI.04 - Acquire vehicle registration information / CI.05 - Acquire User information / CI.07 - Establish User payment account





CI.03 - Inform User on service / CI.06 - Establish User record (contract/OBE) / CI.08 - Personalise OBE / CI.09 - Initial database in OBE (map, tariffs) / CI.10 - Issue OBE to User / CI.11 - Install and mount OBE



Procedure that shall be standardized →



2.2.3 Description of the related procedures

CONTRACT ISSUING TO THE USER	Main objective	Quality requirements	Actors involved	Initialisation event	Finalisation event	Activities included	Data elements / messages format	Communication	Time and frequency	Security measures	How to handle errors and failures
CI.01 Issue contract to the user	To issue the EETS Contract to the User	Assure the confidentiality.	EP and US. The EP is in charge of issuing the EETS contract but it is necessary the US collaboration.	The US requests an EETS OBE. The US has different channels to do it.	The contract has been signed.	See activity diagram. Provide contract and provide Service Information procedures will be up to the EP. However some data fields on the contract and the basic Service Information shall be standardized within EETS.	The basic elements and the clauses to be forwarded to the US shall be standardized throughout the EETS but the rest should be completely open to the EP.	The EP has to decide it.	Every time the US requests an OBE.	The contract shall be protected with EETS security policy.	
CI.02 Associate payment means to OBE	To choose a payment means.	Assure the confidentiality.	US	The EP provides subscription forms and Service information to the US.	The US provides the full filled form to the EP.	See activity diagram. Provide subscription forms procedure will be up to the EP. However some data fields on the subscription form shall be standardized within EETS.	The basic elements of subscription form shall be standardized throughout the EETS but the rest should be completely open to the EP.	The EP has to decide it.	Every time the US requests an OBE.	The subscription form shall be protected with EETS security policy.	
CI.03 Inform user on service	To provide information to the US about the main aspects of the service before, during and after the contract issuing.	Assure the integrity of the information.	EP and US. The EP is in charge of informing the US and the US has to receive the information.	This procedure can take place in different moments. The initialisation event could be: an user information/subscription request and to provide the contract or the OBE to user.	The US has received the information.	See activity diagram. Provide information procedures shall be standardized within EETS.	The information to distribute shall be standardized throughout the EETS.	The EP has to decide it.	Every time the US requests an OBE.	Not applicable.	
CI.04 Acquire vehicle registration information	To acquire necessary personal data and vehicle data	Assure confidentiality and data integrity.	EP and US. The EP has to request the personal and vehicle data to the user, who has to provide it.	The EP provides subscription forms and Service information to the US.	The US has provided the full filled form with the information and the required documentation.	See activity diagram. Provide full filled forms and required documentation procedure to EP shall be standardized within EETS.	Some data fields in the subscription form and the necessity to provide copies of documents shall be standardized throughout the EETS.	The EP has to decide it.	Every time the US requests an OBE.	The personal and vehicle data shall be protected with EETS security policy.	
CI.05 Acquire User information	To acquire personal data	Assure confidentiality and data integrity.	EP and US. The EP has to request the personal data to the user, who has to provide it.	The EP provides subscription forms and Service information to the US.	The US has provided the full filled form with the information and the required documentation.	See activity diagram. Provide full filled forms and required documentation procedure to EP shall be standardized within EETS.	Some data fields in the subscription form and the necessity to provide copies of documents shall be standardized throughout the EETS.	The EP has to decide it.	Every time the US requests an OBE.	The personal data shall be protected with EETS security policy.	
CI.07 Establish user payment account	To establish the user payment account for the OBE	Assure confidentiality and data integrity. Verify payment means.	US and EP	This procedure can be place in 2 different moments: after choosing the payment means (during the subscription phase) or when the US wishes.	The US has provided the full filled form with the information or the US has established the bank account or the pre-payment through an ATM machine or another channel.	See activity diagram. Provide full filled form procedure, in the first option, and associate bank account through an ATM machine in the second option.	The basic elements of subscription form shall be standardized throughout the EETS but the rest should be completely open to the EP.	The EP has to decide it.	Every time the US requests an OBE or the US wants to change the payment account.	The bank account shall be protected with EETS security policy if the US provided it to EP.	
CI.06 Establish user record (contract OBE)	To record the data supplied on the EETS subscription in the Central System	Assure confidentiality and data integrity.	EP	The contract has been signed.	The data has been recorded.	See activity diagram.	The basic stored information during the subscription phase will be up to the EP.	Individually.	Every time the US requests an OBE.	The information recorded may be maintained in a secure way according to laws related to data privacy	
CI.08 Personalise OBE	To record the vehicle and personal data into the OBE	Assure confidentiality and data integrity.	EP	The contract has been signed.	The US data has been recorded.	See activity diagram.	The information stored in the user record. It shall be standardized throughout the EETS.	Individually.	Every time the US requests an OBE.	The information recorded may be maintained in a secure way according to laws related to data privacy	
CI.09 Initial database in OBE (map, tariffs)	To record relevant service data into the OBE	Assure the integrity of the information.	EP	The contract has been signed and the OBE is for an autonomous system.	The initial database has been recorded.	See activity diagram.	The initial service information shall be standardized throughout the EETS.	Individually.	Every time the US requests an OBE.	The information shall be protected with EETS security policy.	
CI.10 Issue OBE	To provide certified OBE to user		EP and US	The OBE has been initialised and personalised.	The US has received the OBE.	See activity diagram.	Not applicable.	The EP has to decide it.	Every time the US requests an OBE.	The OBE delivery shall be protected with EETS security policy.	
CI.11 Install and mount OBE	To install the OBE in the US vehicle	The quality installation requirements shall be standardized throughout the EETS.	In a self-installation process the US is the only actor involved but in a complex installation process, the EP has to participate in it.	The personalised OBE has been delivered to US.	The OBE has been installed.	See activity diagram.	Not applicable.	Not applicable.	Every time the US requests an OBE.	Not applicable.	The US can contact with the Customer Service Support and Help Desk.



2.3 Service Use on toll roads - DSRC

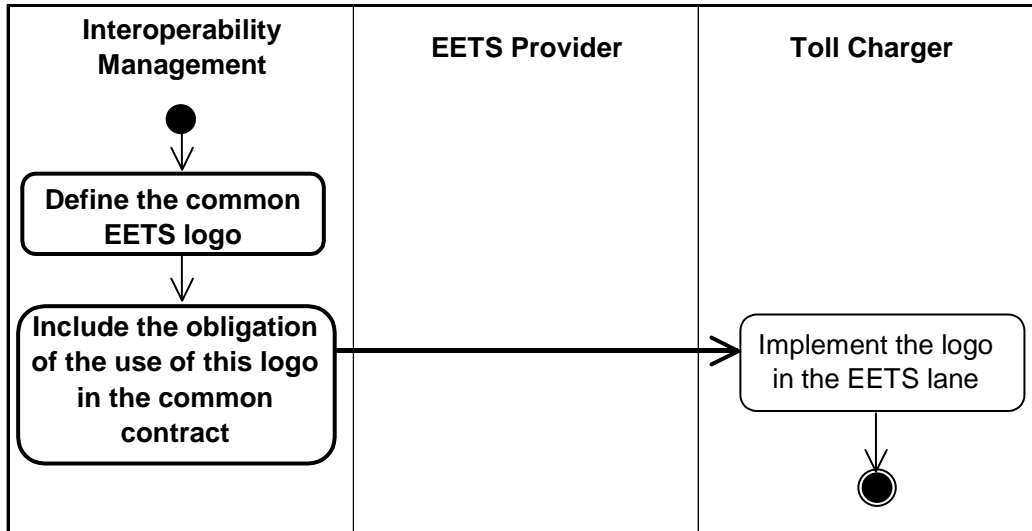
2.3.1 Interoperability needs as defined in the WP2 – D2.1

EETS SERVICE COMPONENT AND FUNCTIONS		Roles	Interoperability needs	
			YES	NO
SERVICE USE ON TOLL ROADS - DSRC				
SU-DSRC 1 Service signalling on roadside				
SU-DSRC 1.1	Inform User on tolling when entering/leaving toll road/network	TC		×
SU-DSRC 1.2	Inform User on : correct lane use	TC	×	
SU-DSRC 2 Produce tolling transaction (DSRC)				
SU-DSRC 2.1	Inform User on OBE status	EP		×
SU-DSRC 2.2	Declare variable vehicle parameters	US	×	
SU-DSRC 2.3	Transmit Toll déclaration	TC	×	
SU-DSRC 2.4	Conclude tolling transaction	TC		×
SU-DSRC 2.5	Store tolling transaction	TC		×
SU-DSRC 3 Extended mode				
SU-DSRC 3.1	Offer extended mode	TC		×

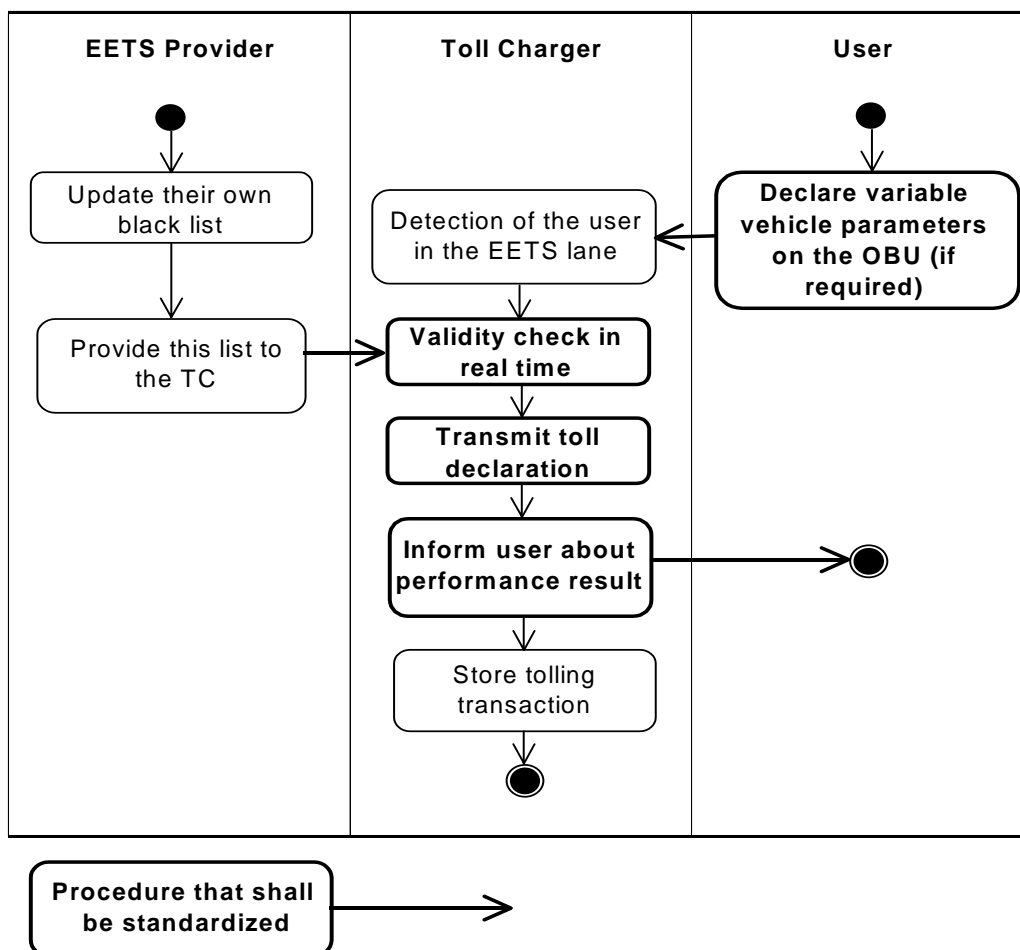


2.3.2 Procedure diagram

SU-DSRC.1 - Service signalling on roadside



SU-DSRC.2 - Produce tolling transaction (DSRC)





2.3.3 Description of the related procedures

SERVICE USE ON TOLL ROADS - DSRC		Main objective	Quality requirements	Actors involved	Initialisation event	Finalisation event	Activities included	Data elements / messages format	Communication	Time and frequency	Security measures	How to handle errors and failures
SU-DSRC1 - Service signalling on roadside	SU-DSRC1.2 - Inform user on correct lane	to ensure that the user could quickly identify the lane to be used for EETS (if required)	use the same EETS logo in all related lanes	TC and User are involved in the process but it's the IM who has to define the common logo to be used by the TC	elaboration of the common logo	EETS logo implemented in the related lanes		Elaboration of common EETS logo	Visual	No frequency, on roadside		the use of the EETS logo should be included in the common service definition
	SU-DSRC2.2 - Declare variable vehicle parameters	the user has to declare the variable vehicle parameters in according to the local needs (i.e. axles in Austria)	The user has to know in which system he has to declare which parameters.	The User is responsible of the declaration of parameters. The TC has to recognise them.	Preparation of next trip (if required by present system)	Parameters declared	Variable vehicle parameters have to be declared on the HMI of OBU by the user (depending on system where the user is currently driving)	according to the EETS specification (OBE and HMI requirements defined in Certification requirements in Contract Issuing)	by DSRC	Before next trip with changed fee relevant parameters (connection of a trailer),		Wrong declaration can be changed in some systems and requires contact via the EP
SU-DSRC2 - Produce tolling transaction (DSRC)	SU-DSRC2.3 - Transmit toll declaration	if the case of a valid user contract, store the data related to this user and allow him to go through the toll	OBE performs the tolling transaction of the TC	The TC has to perform the tolling declaration	EETS user in security check accepted	transaction successfully finished	Will be controlled by the road-side equipment of TC	according to the EETS specification	by DSRC	in every DSRC transaction after successful security check	defined in DSRC standard	User has to be informed about unsuccessful transaction and he has to contact the EP and/or TC



2.4 Service Use on toll roads – Autonomous system

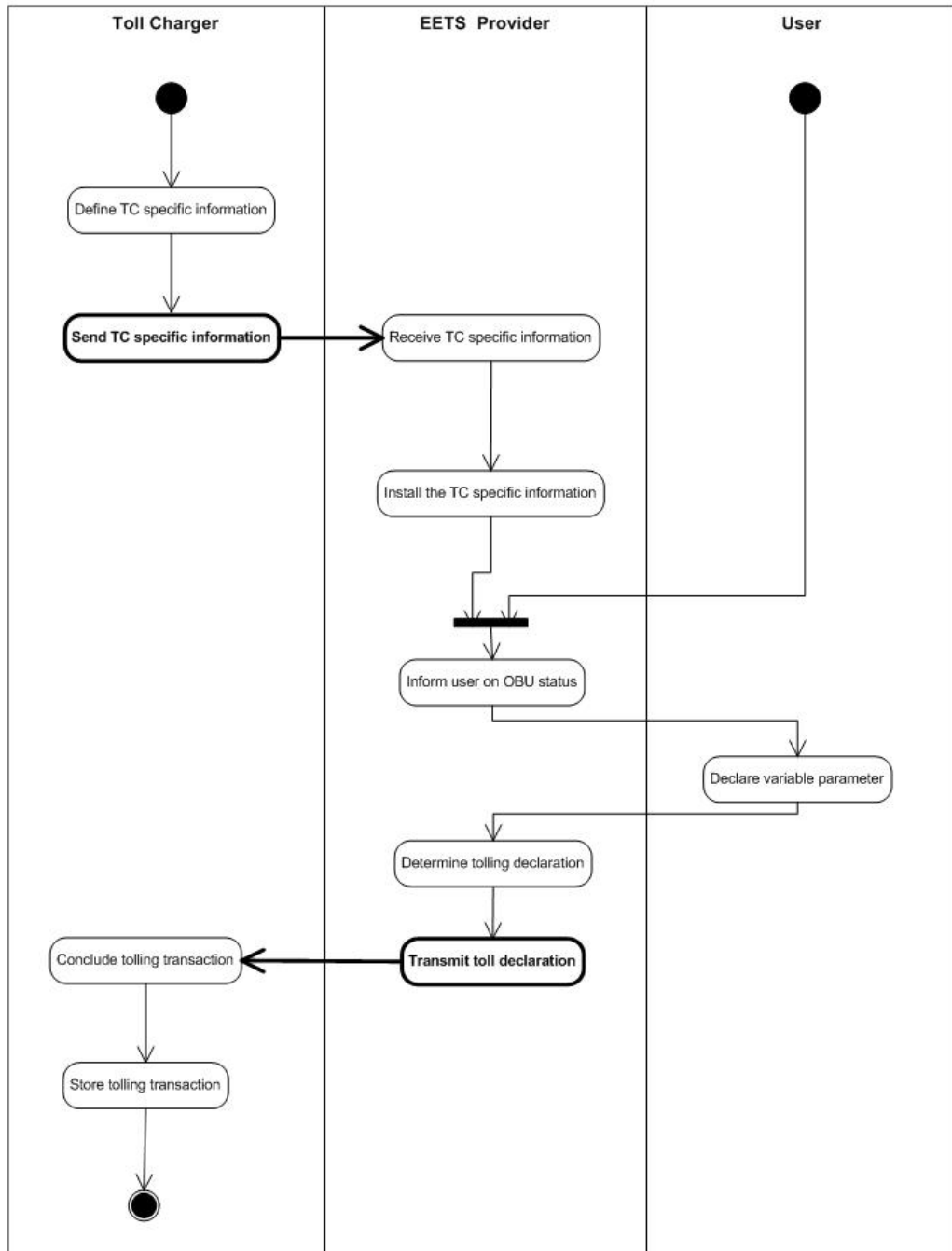
2.4.1 Interoperability needs as defined in the WP2 – D2.1

EETS SERVICE COMPONENT AND FUNCTIONS		Roles	Interoperability needs	
			YES	NO
SERVICE USE ON TOLL ROADS – Autonomous system				
SU-AS1	Service signalling on roadside			
SU-AS1.1	Inform User on tolling when entering/leaving toll road/network	TC		×
SU-AS 1.2	Inform User on : correct lane use	TC	×	
SU-AS2	Produce tolling transaction			
SU-AS2.1	TC specific information	TC	×	
SU-AS2.2	Inform User on OBE status	EP		×
SU-AS2.3	Declare variable parameters	US		×
SU-AS2.4	Determine toll declaration	EP		×
SU-AS2.5	Transmit toll declaration	EP	×	
SU-AS2.6	Conclude tolling transaction	TC		×
SU-AS2.7	Store tolling transaction	TC		×
SU-AS3	Extended mode			
SU-AS3.1	Offer extended mode	TC		×



2.4.2 Procedure diagram

SU-AS2 – Produce tolling transaction



Procedure that shall be standardized →



2.4.3 Description of the related procedures

Service use on toll roads - autonomous based systems		Main objective	Quality requirements	Actors involved	Initialisation event	Finalisation event	Activities included	Data elements / messages format	Communication	Time and frequency	Security measures	How to handle errors and failures
SU-AS2 Produce tolling transaction (GNSS)	SU-AS2.1 TC specific information (incl. Definition of toll declaration)	The necessary toll rules (e.g. tariff, map data, etc) should be defined.	All toll rules must be defined by the toll operators and should include all toll areas.	TC	As agreed by TC and EP (e.g. inclusion of new streets or tariff etc.)	The EP confirmed the update	see activity diagram.	confirmed standard of EETS data interchange (interface standard)	confirmed standard of interchange EETS data	as agreed by TC and EP	data transaction records shall be protected in line with EETS security policy	Individually or in line with EETS common procedures
	SU-AS2.5 Transmit toll declaration	The EETS Provider transmits the toll declaration to the Toll Charger	Secure and complete data transmission without any data loss	EP	As agreed by TC and EP (e.g. time dependent, event dependent)	TC confirmed the received data	See activity diagram.	confirmed standard of EETS data interchange (interface standard)	confirmed standard of interchange EETS data	as agreed by TC and EP	data transaction records shall be protected in line with EETS security policy	documented by TC and informed the EP



2.5 Service Payment

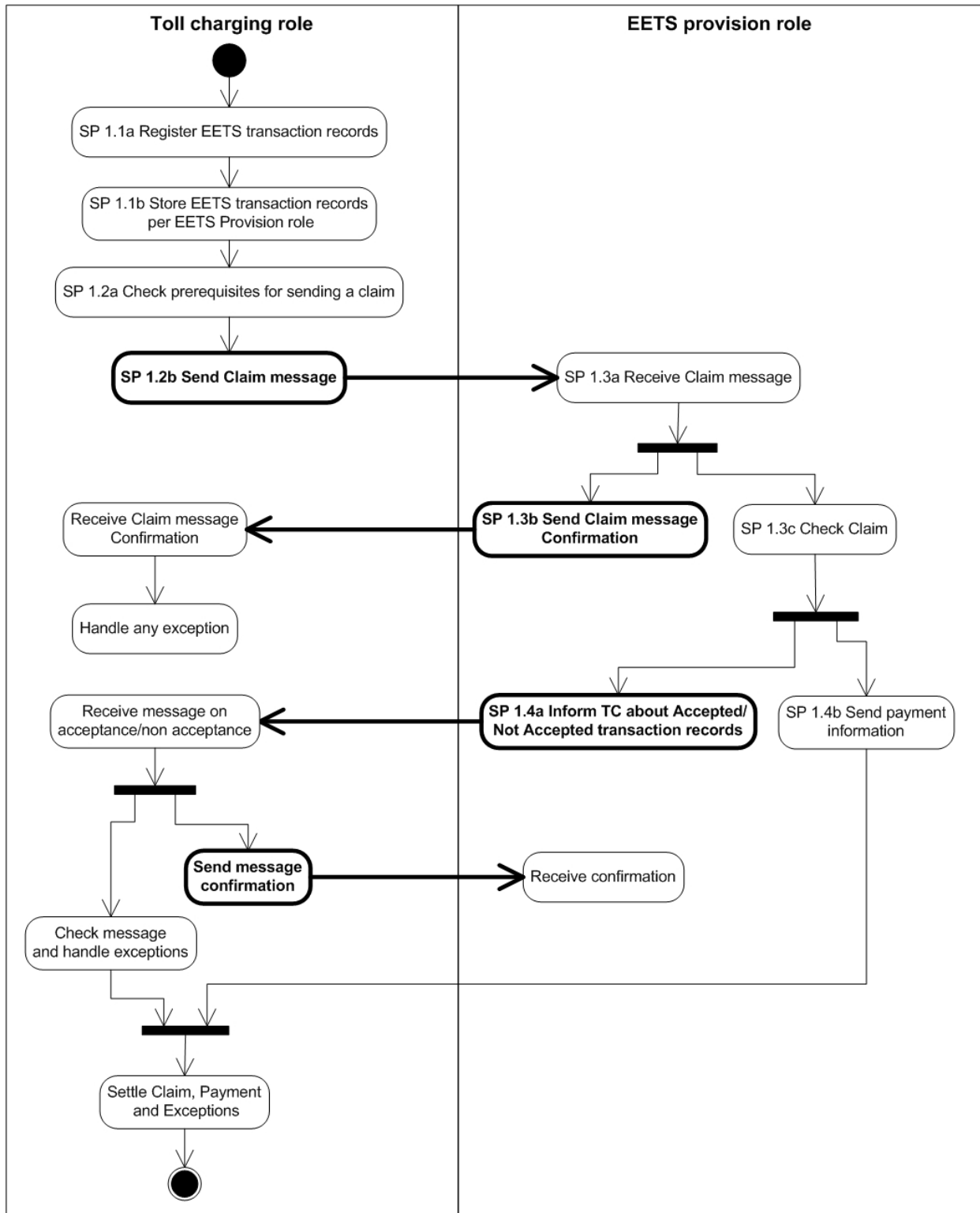
2.5.1 Interoperability needs as defined in the WP2 – D2.1

EETS SERVICE COMPONENT AND FUNCTIONS		Roles	Interoperability needs	
			YES	NO
SERVICE PAYMENT				
SP 1	Invoice to the EP			
SP 1.1	Collect stored tolling transactions per issuer	TC		×
SP 1.2	Claim payment from EETS provider	TC	×	
SP 1.3	Check claims	EP	×	
SP 1.4	Pay Toll Charger / Inform TC about payment	EP	×	
SP 2	Invoice to Users			
SP 2.1	Collect all received tolling transactions per User	EP		×
SP 2.2	Issue invoice to User	EP	×	
SP 2.3	Pay EETS Provider	US		×



2.5.2 Procedure diagram

SP.1 – Invoice to the EP

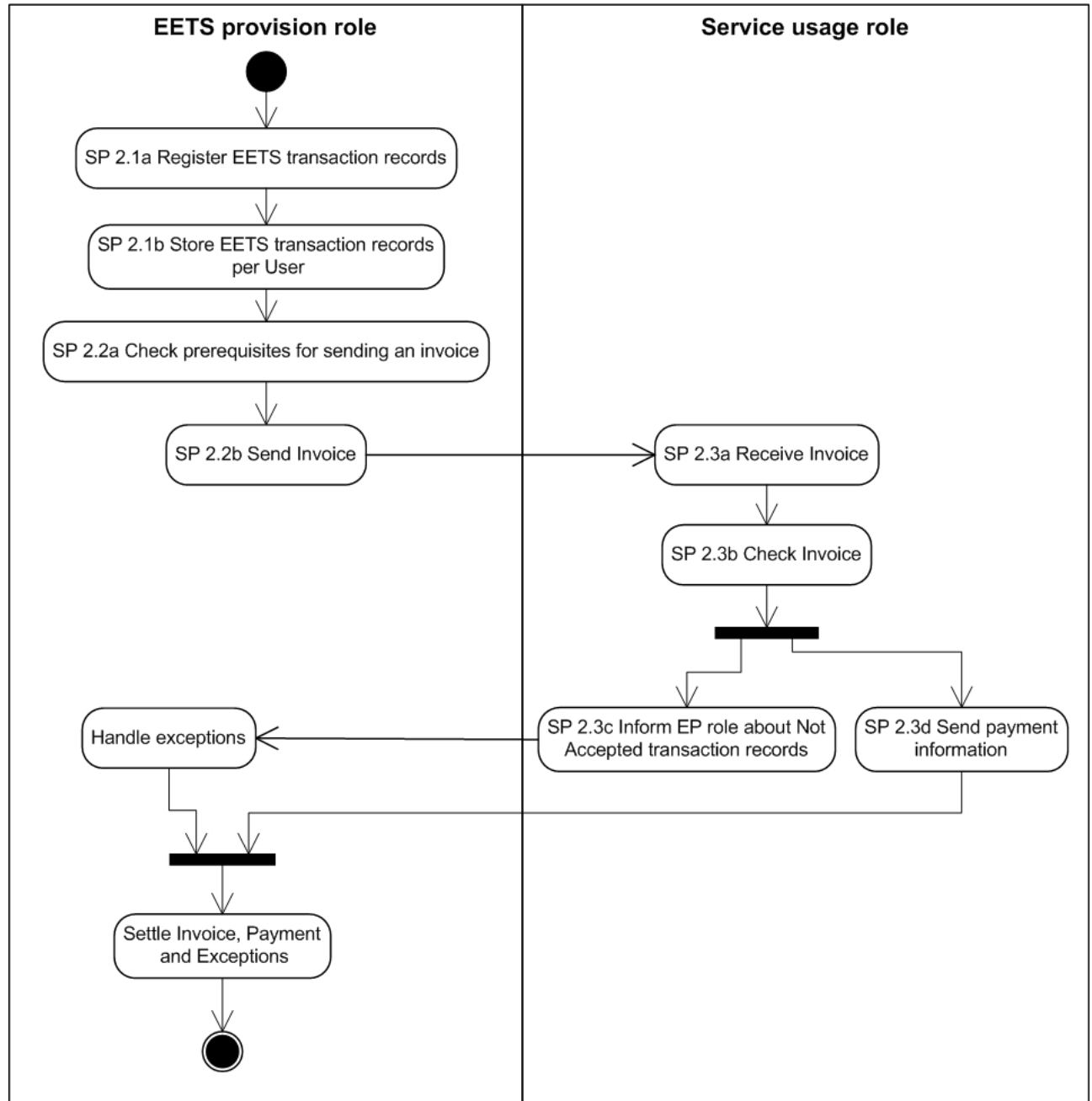


Procedure and message that shall be standardised within EETS →



SP.2 – Invoice to Users

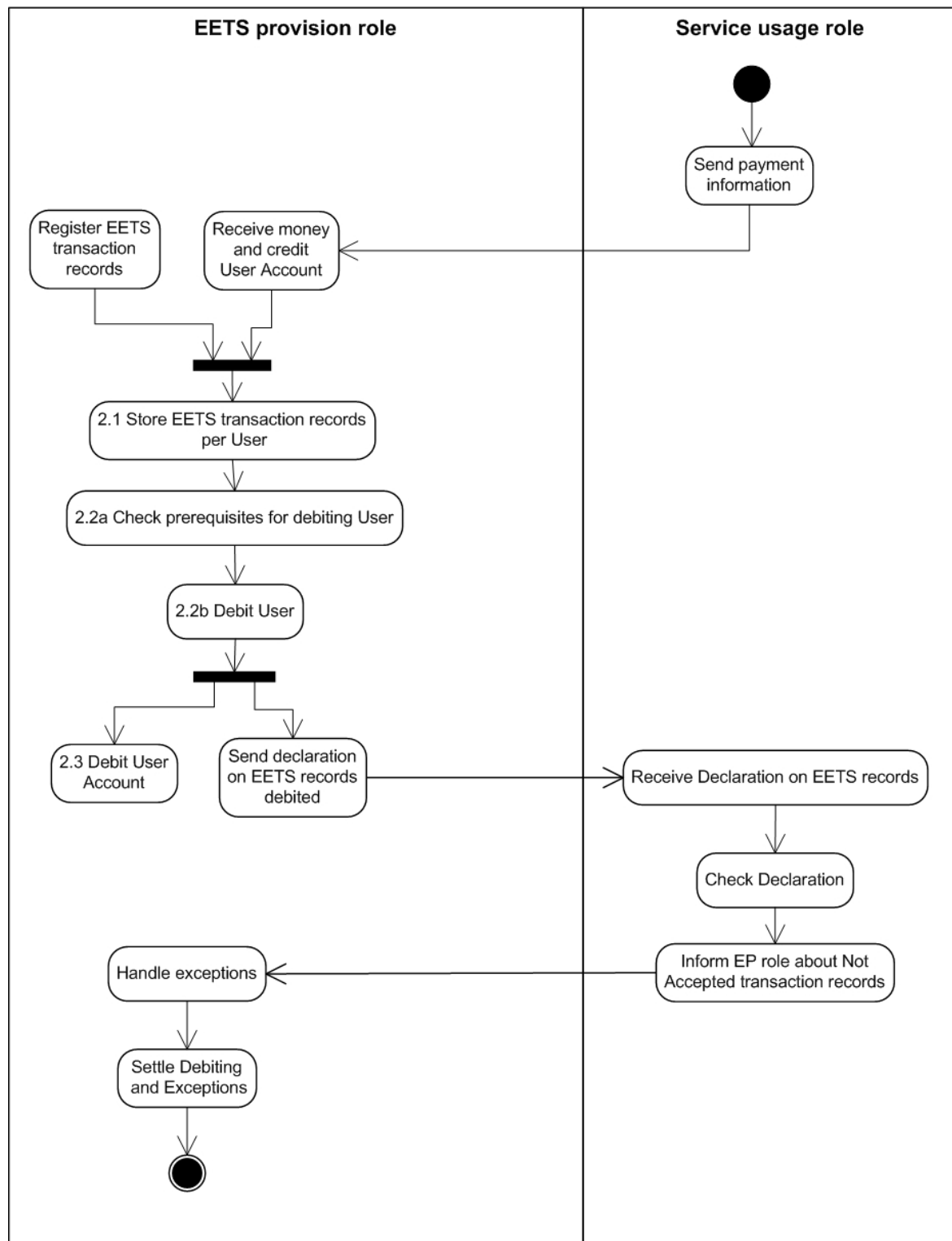
Post Payment :



Procedure and message that shall be standardised within EETS →



Pre Payment :



Procedure and message that shall be standardised within EETS →



2.5.3 Description of the related procedures

SERVICE PAYMENT	Sub-function	Main objective	Quality requirements	Actors involved	Initialisation event	Finalisation event	Activities included	Data elements / messages format	Communication	Time and frequency	Security measures	How to handle errors and failures
1 Invoice to the EP	1.2 Claim payment from EETS Provider	To build and send the Claim consisting of EETS transaction records	All EETS transaction records sent by the TC shall be received by the EP while protecting the integrity and the confidentiality of the transactions	TC and EP with the TC initialising the procedure. The TC is the actor being responsible for that the procedure is completed.	The prerequisite for sending a claim is present, e.g. 24 hours has elapsed since last cluster of claims (ClaimFile) was sent	The TC has handled any exceptions after having received a confirmation that the claim has been received by the EP	See activity diagram. The procedures covering sending information between the TC and EP and vice versa shall be harmonised within EETS	The messages between the TC and EP shall be harmonised throughout the EETS	As agreed by TC and EP	As agreed by TC and EP	As agreed by TC and EP	Individually or as agreed by TC and EP or in line with EETS common procedures
	1.3 Check Claims	To check each EETS transaction record to see whether it is a valid record	Only valid EETS transaction records shall be reimbursed	EP	A Claim message has been received	The EP has received a confirmation message on the message sent by EP containing Accepted/Not Accepted EETS transaction records	See activity diagram. The procedures covering sending information between the TC and EP and vice versa shall be harmonised within EETS	The messages between the TC and EP shall be harmonised throughout the EETS	As agreed by TC and EP	As agreed by TC and EP	As agreed by TC and EP	Individually or as agreed by TC and EP or in line with EETS common procedures
	1.4 Pay Toll Charger / Inform TC about payment	The TC shall receive payment for the transport service provided	Not applicable	TC and EP with the EP initialising the procedure. The EP is the actor being responsible for that the procedure is completed.	A claim message has been checked and one or more EETS transaction records have been found valid	Claims, payments and any exception have been settled	See activity diagram.	As agreed by TC and EP	As agreed by TC and EP	As agreed by TC and EP	As agreed by TC and EP	Individually or as agreed by TC and EP or in line with EETS common procedures
2 Invoice to the User	2.2 Issue invoice to User	To build and send the Invoice consisting of EETS transaction records	All EETS transaction records sent by the EP shall be received by the correct User	User and EP with the EP initialising the procedure. The EP is the actor being responsible for that the procedure is completed.	The prerequisite for sending an invoice is present, e.g. 1 month has elapsed since last invoice was sent	The invoice, the payments and any exceptions are settled	See activity diagram.	Individually or in line with EETS common procedures	As agreed by User and EP	As agreed by User and EP	As 2.1	Individually or in line with EETS common procedures



2.6 Service User Support

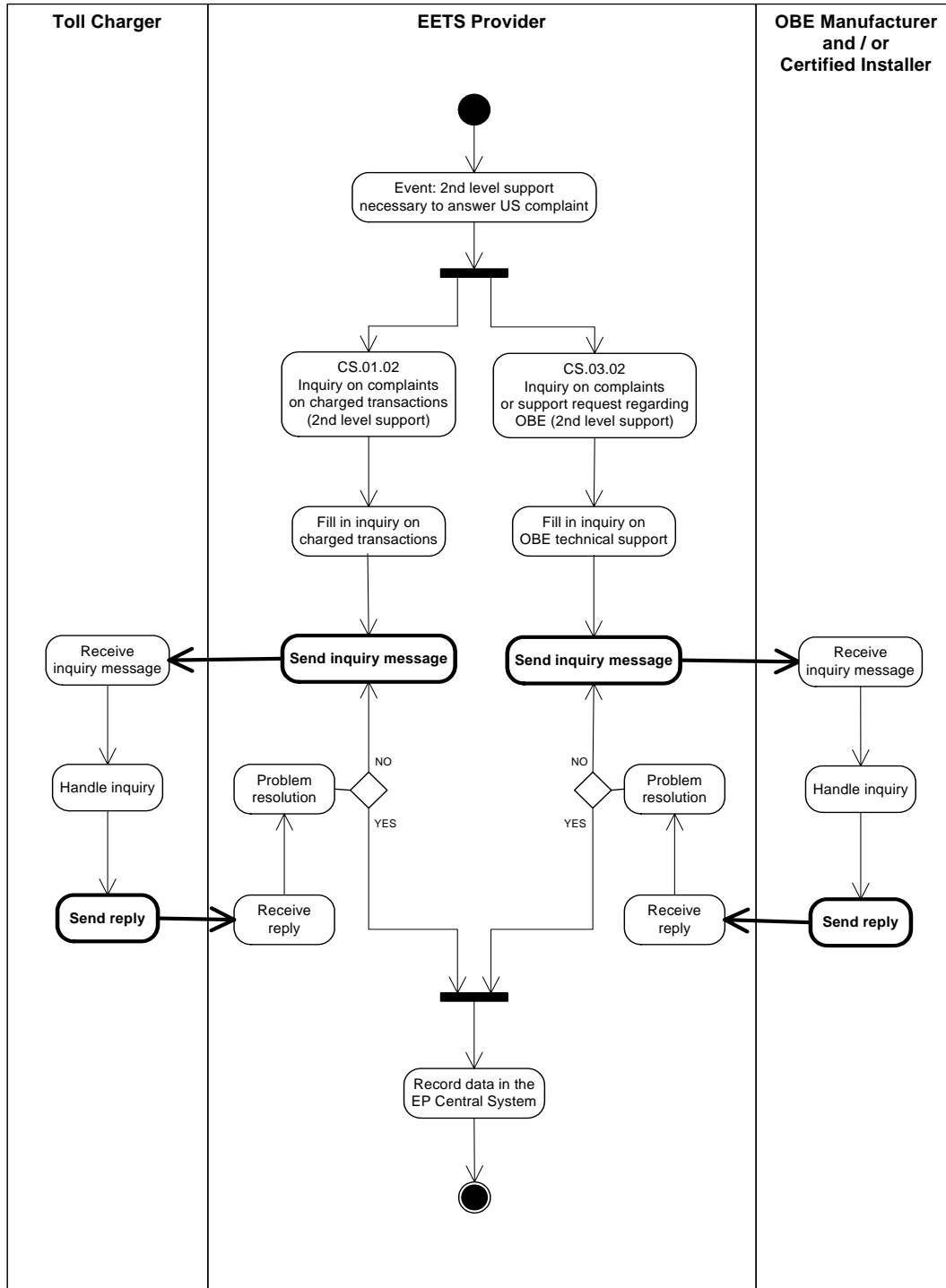
2.6.1 Interoperability needs as defined in the WP2 – D2.1

EETS SERVICE COMPONENT AND FUNCTIONS		Roles	Interoperability needs	
			YES	NO
SERVICE USER SUPPORT				
CS.01 Complaints about charged fees				
CS.01.01	Receive User complaints on charged transactions	EP		×
CS.01.02	Inquiry on complaints on charged transactions (2 nd level support)	EP	×	
CS.01.03	Inform User about result on charged transactions complaint	EP		×
CS.02 Contract management				
CS.02.01	Contract modification	EP		×
CS.02.02	Payment means modification	EP		×
CS.02.03	Contract cancellation	EP	×	
CS.03 Technical support				
CS.03.01	Receive User's complaints or support request regarding OBE	EP		×
CS.03.02	Inquiry on complaints or support request regarding OBE (2 nd level support)	EP	×	
CS.03.03	Inform User on solving OBE issue	EP		×
CS.03.04	Update data, map, tariffs and/or software	EP		×
CS.03.05	OBE technical support (repair, battery change)	EP		×
CS.04 General information about the service				
CS.04.01	Inform Users on service	EP/TC		×
CS.05 Quality management information				
CS.05.01	Inform EETS Management about User's complaints and support requests	EP	×	



2.6.2 Procedure diagram

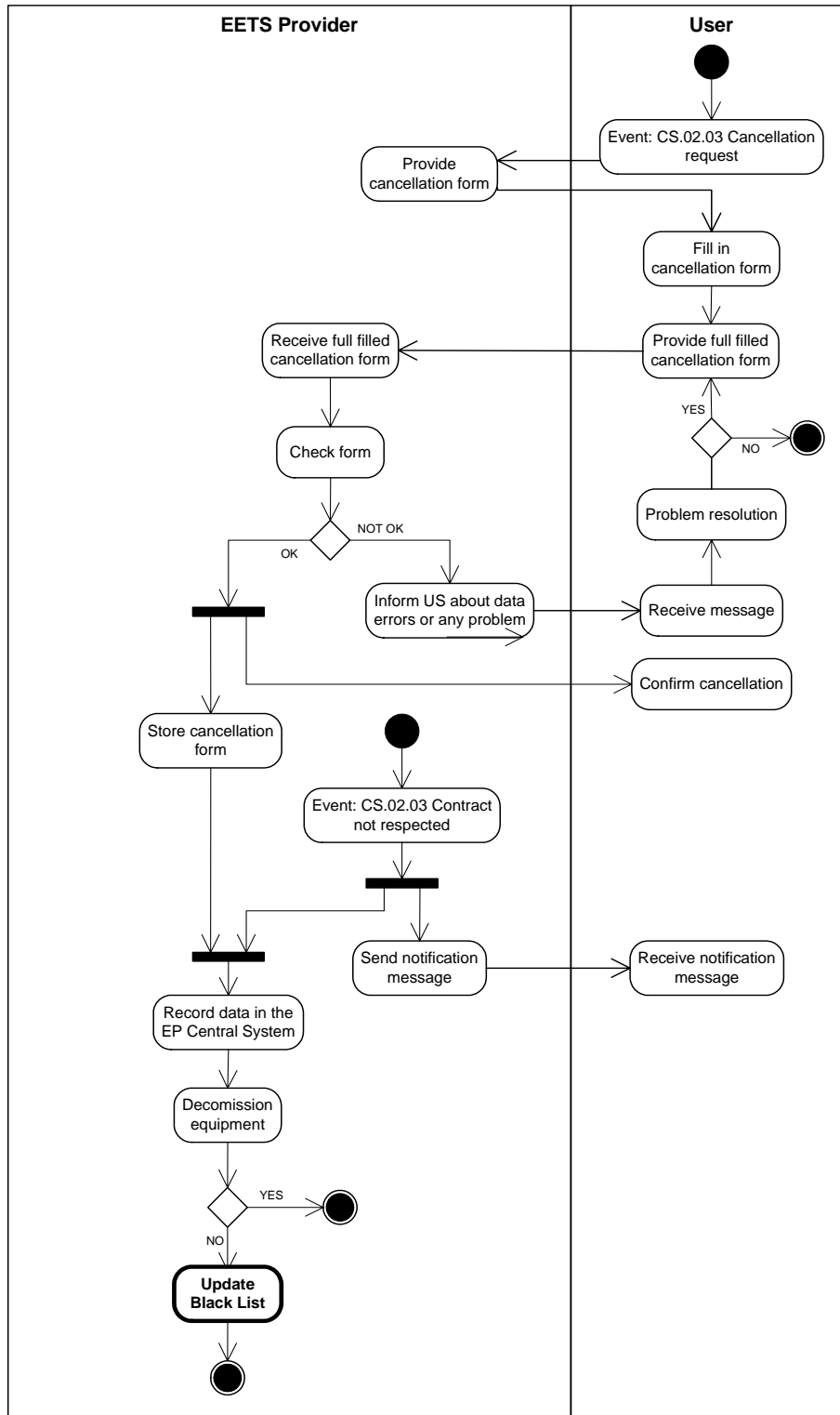
CS.01.02 - Inquiry on complaints on charged transactions (2nd level support) / CS.03.02 - Inquiry on complaints or support request regarding OBE (2nd level support)



Procedure and message that shall be standardised within EETS →



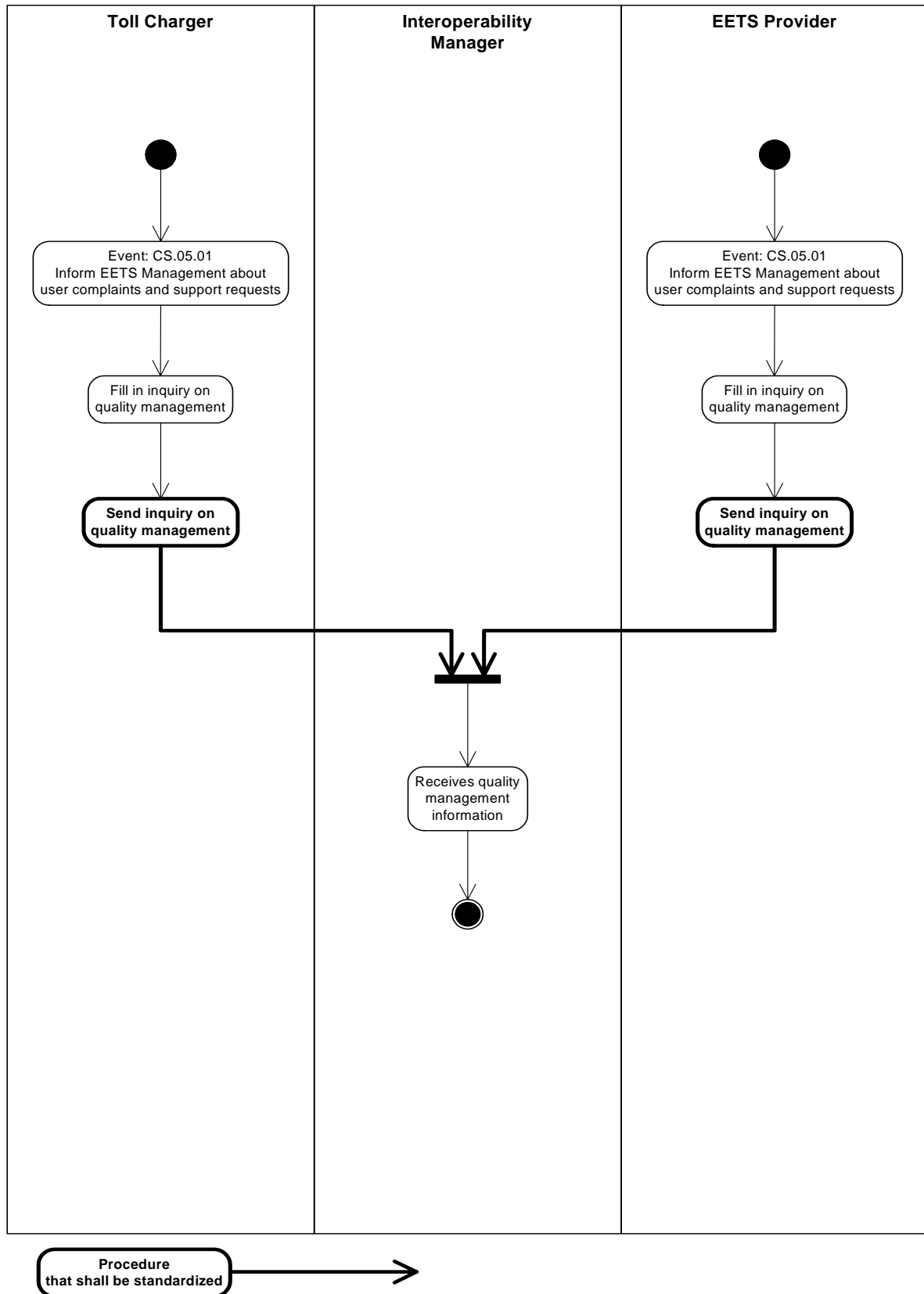
CS.02.03 - Contract cancellation



Procedure and message that shall be standardised within EETS →



CS.05.01 - Inform EETS Management about User complaints and support requests





2.6.3 Description of the related procedures

SERVICE USER SUPPORT		Main objective	Quality requirements	Actors involved	Initialisation event	Finalisation event	Activities included	Data elements / messages format	Communication	Time and frequency	Security measures	How to handle errors and failures
CS.01 Complaints about charged fees	CS.01.02 Inquiry on complaints on charged transactions (2nd level support)	TC to assist EP on solving US complaints on charged transactions	Assure the confidentiality and agreed SLAs	EP and TC	The EP requests the assistance of the TC	The EP receives a valid answer from the TC	See activity diagram	The interface between the EP and the TC and the data format shall be standardized throughout the EETS	As agreed by EP and TC	Every time the EP needs the assistance of the TC to answer a US complaint on charged transactions	The information exchanged between the EP and the TC shall be protected with EETS security policy	
CS.02 Contract management	CS.02.03 Contract cancellation	Cancel a contract making it invalid within EETS	Assure the confidentiality and agreed SLAs	US and EP	Either the US requests the contract cancellation or the EP takes that decision	Contract is invalid within EETS	See activity diagram	The black list update shall be standardized throughout the EETS	The EP has to decide it	Every time the US or the EP decide to cancel a contract	The cancellation form shall be protected with EETS security policy	
CS.03 Technical support	CS.03.02 Inquiry on complaints or support request regarding OBE (2nd level support)	OBE manufacturers and/or specialized companies to assist EP on solving US complaints or support requests regarding the OBE	Assure the confidentiality and agreed SLAs	EP and OBE manufacturers and/or specialized companies	The EP requests the assistance of the OBE manufacturer and/or specialized companies	The EP receives a valid answer from the OBE manufacturer and/or specialized companies	See activity diagram	A process protocol between the EP and OBE manufacturer and/or specialized companies shall be standardized throughout the EETS	The EP has to decide it	Every time the EP needs the assistance of the OBE manufacturer and/or specialized companies to answer a US complaint regarding the OBE	The information exchanged between the EP and the OBE manufacturers and/or specialized companies shall be protected with EETS security policy	
CS.05 Quality management information	CS.05.01 Inform EETS Management about user complaints and support requests	Inform the IM about user complaints regarding transactions or the OBE, in order to control the quality of the service	Assure confidentiality and data integrity.	IM, EP and TC	The EP and the TC send to the IM information regarding user complaints	The IM receives from the EP and the TC information regarding user complaints	See activity diagram	The interface between the IM, the EP and the TC and the data format shall be standardized throughout the EETS	As agreed by EP, TC and IM	Regular basis	The information exchanged between the IM, the EP and the TC shall be protected with EETS security policy	



2.7 Enforcement Support

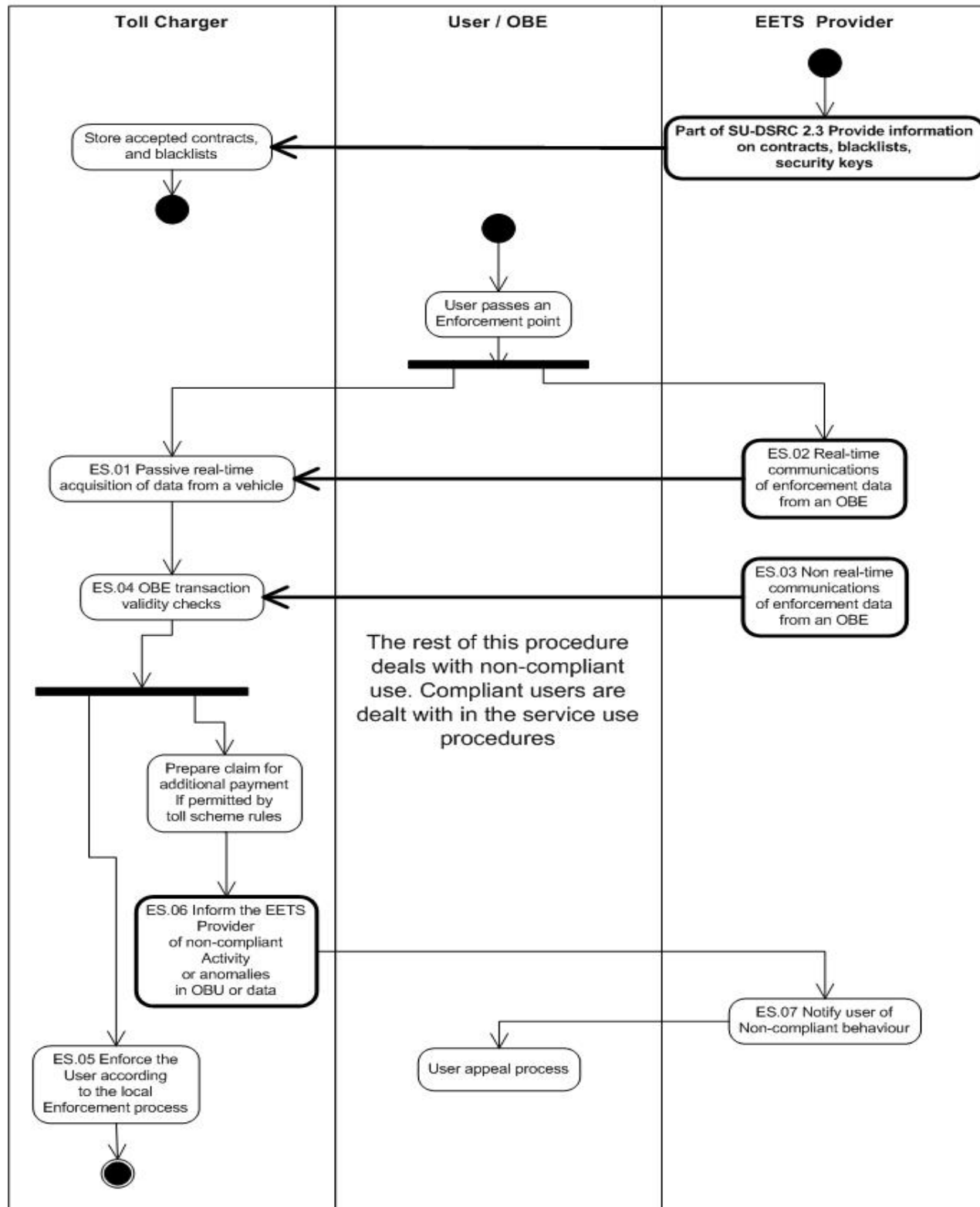
2.7.1 Interoperability needs as defined in the WP2 – D2.1

SERVICE COMPONENT		Roles	Interoperability needs	
			Yes	No
ENFORCEMENT SUPPORT				
ES01	Passive real time acquisition of enforcement data from an OBE (typically through Automatic Number-Plate Recognition equipment). This is part of the local enforcement system operated by the Toll Charger and not considered to required to be interoperable.	TC		×
ES02	Real time communication of enforcement data from an OBE (typically through a DSRC-link)	TC/US	×	
ES03	Non-real time communication of enforcement data from an OBE (typically over the Cellular Network-interface)	TC/US	×	
ES04	OBE transaction validity checks	TC/EP	×	
ES05	Execute enforcement (incl. claiming payment of fines)	TC/EP		×
ES06	Informing the EETS Provider of non-compliant activity or anomalies in OBE or data.	TC	×	
ES07	Notify User of non-compliant behaviour	EP	×	



2.7.2 Procedure diagram

ES01 / ES02 / ES03 / ES04 / ES05 / ES07



Procedure and message that shall be standardised within EETS →



2.7.3 Description of the related procedures

ENFORCEMENT	Quality requirements	Actors involved	Initialisation event	Finalisation event	Activities included	Data elements / messages format	Communication	Time and frequency	Security measures	How to handle errors and failures
ES.02 - Real time communication of enforcement data from an OBE (typically through a DSRC-link)	Reliable transaction between the OBE and the Toll Charger	EP (OBE), TC	Vehicle enters enforcement point	Transaction successful	Communication between Toll Charger and OBE	Common transaction	confirmed standard of EETS OBU data interchange (interface standard)	Occurs when each EETS vehicle passes through the enforcement point	EETS transaction records shall be protected in line with EETS security policy	Local enforcement procedures will apply
ES.03 - Non-real time communication of enforcement data from an OBE (typically over the Cellular Network-interface)	Reliable transaction between the OBE and the Toll Charger/EETS Provider	EP(OBE),TC	Event to be defined by the Toll Charger	Transaction successful	Communication between the OBE and Toll Charger/EETS Provider	Common transaction	confirmed standard of EETS OBU data interchange (interface standard)	Defined by the Toll Charger	EETS transaction records shall be protected in line with EETS security policy	Local enforcement procedures will apply
ES.04 - OBE transaction validity checks	Transaction meets requirements for a payment claim	TC	Valid enforcement transaction received	Preparation of a claim	Internal within the Toll Charger	Common transaction		Occurs when each EETS vehicle passes through the enforcement point	EETS transaction records shall be protected in line with EETS security policy	Local enforcement procedures will apply
ES.06 - Informing the EETS Provider of non-compliant activity or anomalies in OBE or data	Transaction does not meet requirements for a payment claim	TC, EP	valid enforcement transaction received	Notification of non-compliant activity	Communication between Toll Charger and EETS Provider	Common transaction	confirmed standard of EETS OBU data interchange (interface standard)	Occurs when each EETS vehicle passes through the enforcement point	EETS transaction records shall be protected in line with EETS security policy	This is an error handling procedure
ES.07 - Notify user of non compliant behaviour	Left to the EP	EP, US	Information on non-compliant use by the user	Time limit for appeal expires, or appeal received	Communication to user	Not standardised	not standardised	When non-compliant event has been detected	EETS transaction records shall be protected in line with EETS security policy	This is an error handling procedure



2.8 Promotion

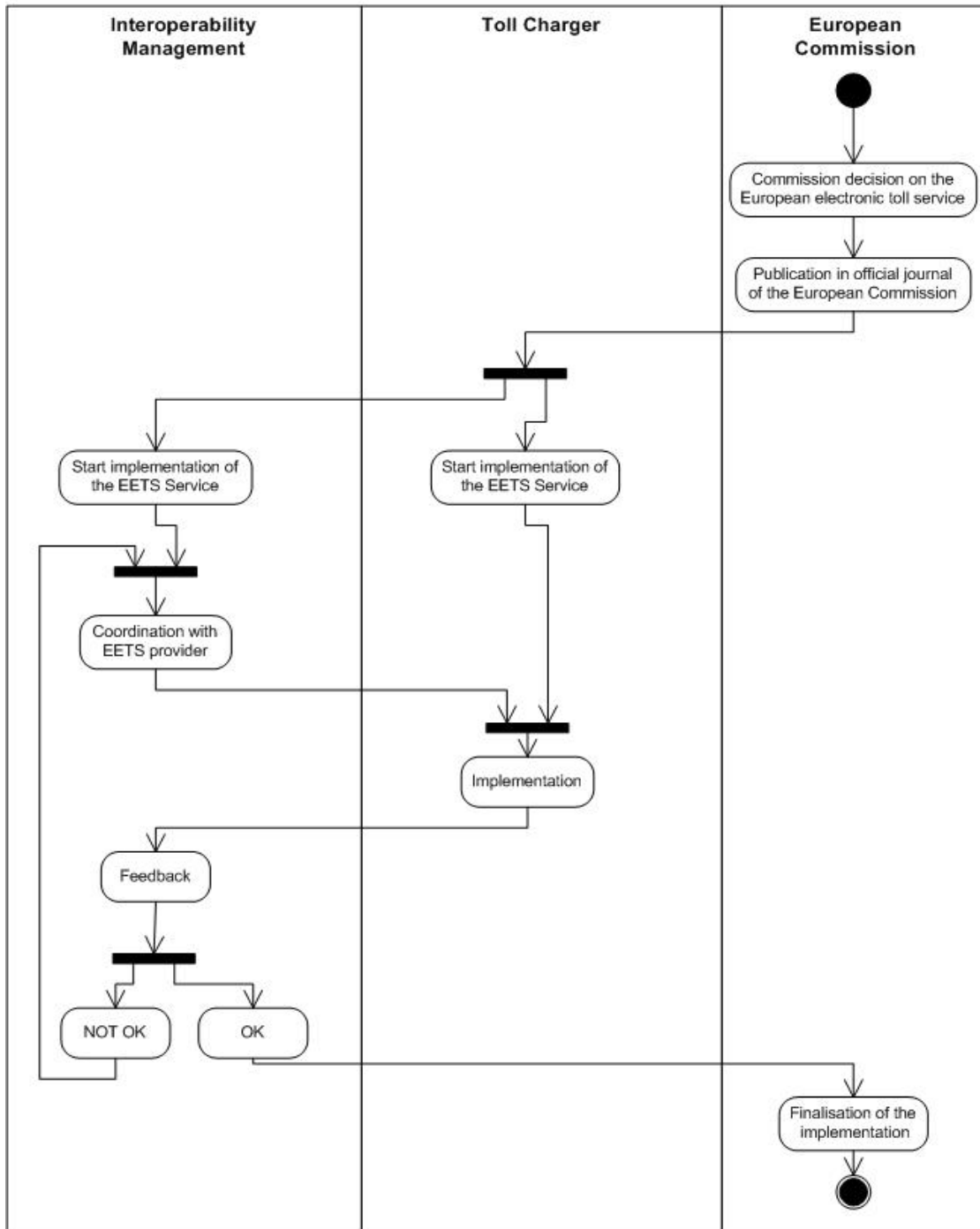
2.8.1 Interoperability needs as defined in the WP2 – D2.1

EETS SERVICE COMPONENT AND FUNCTIONS		Roles	Interoperability needs	
			YES	NO
PROMOTION				
PR01	Implementation of the EETS service	IM	×	
PR02	Increase in the number of Users using EETS	EP/US	×	
PR03	Increase in the number of automatic tolling booths EETS compliant	TC	×	
PR04	Dissemination of information to Users regarding service basic rules	IM	×	
PR05	Information to EETS players, and specifically to Users on future EETS Service developments	IM	×	



2.8.2 Procedure diagram

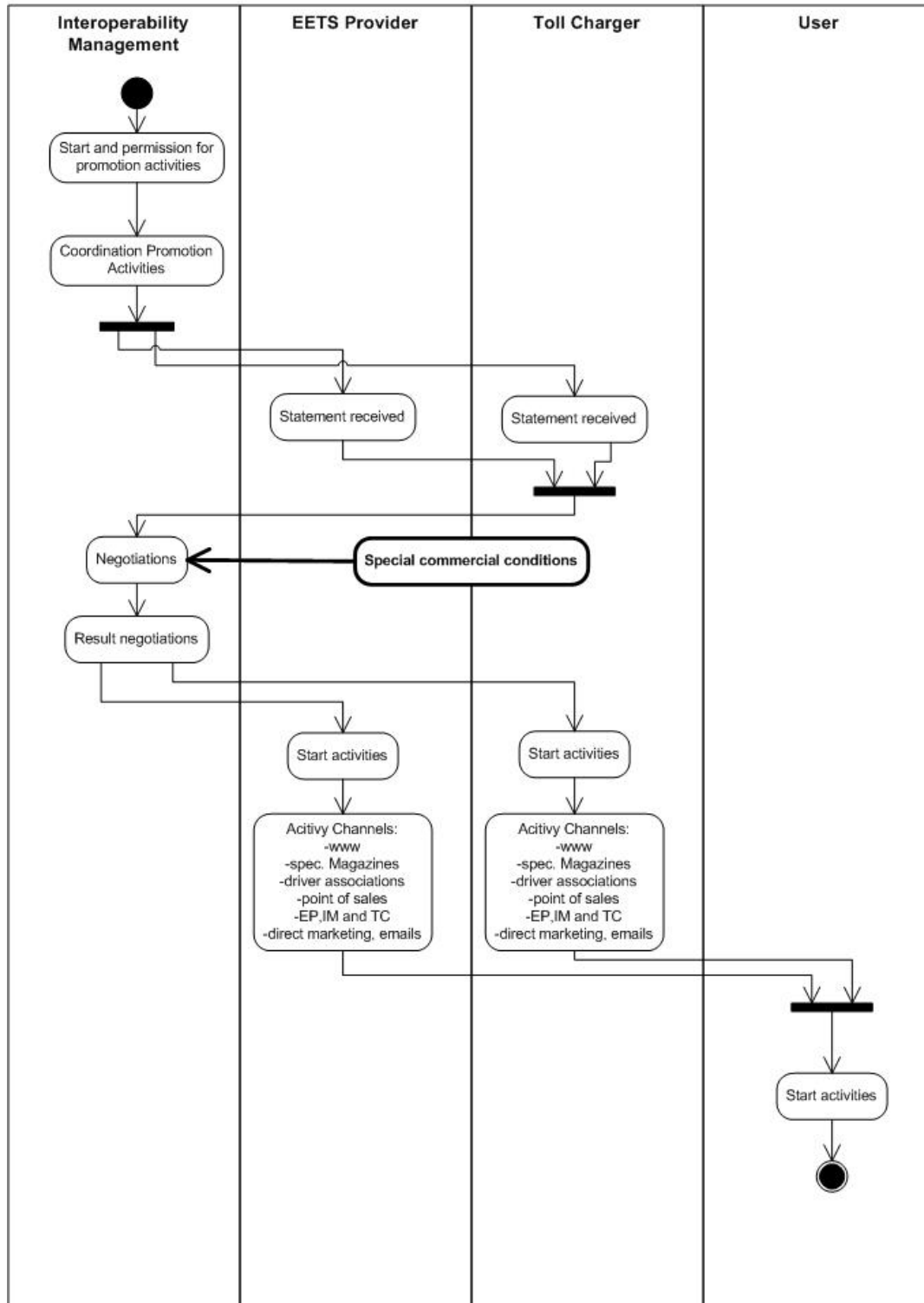
PR01 - Implementation of the EETS service



Procedure and message that shall be standardised within EETS →



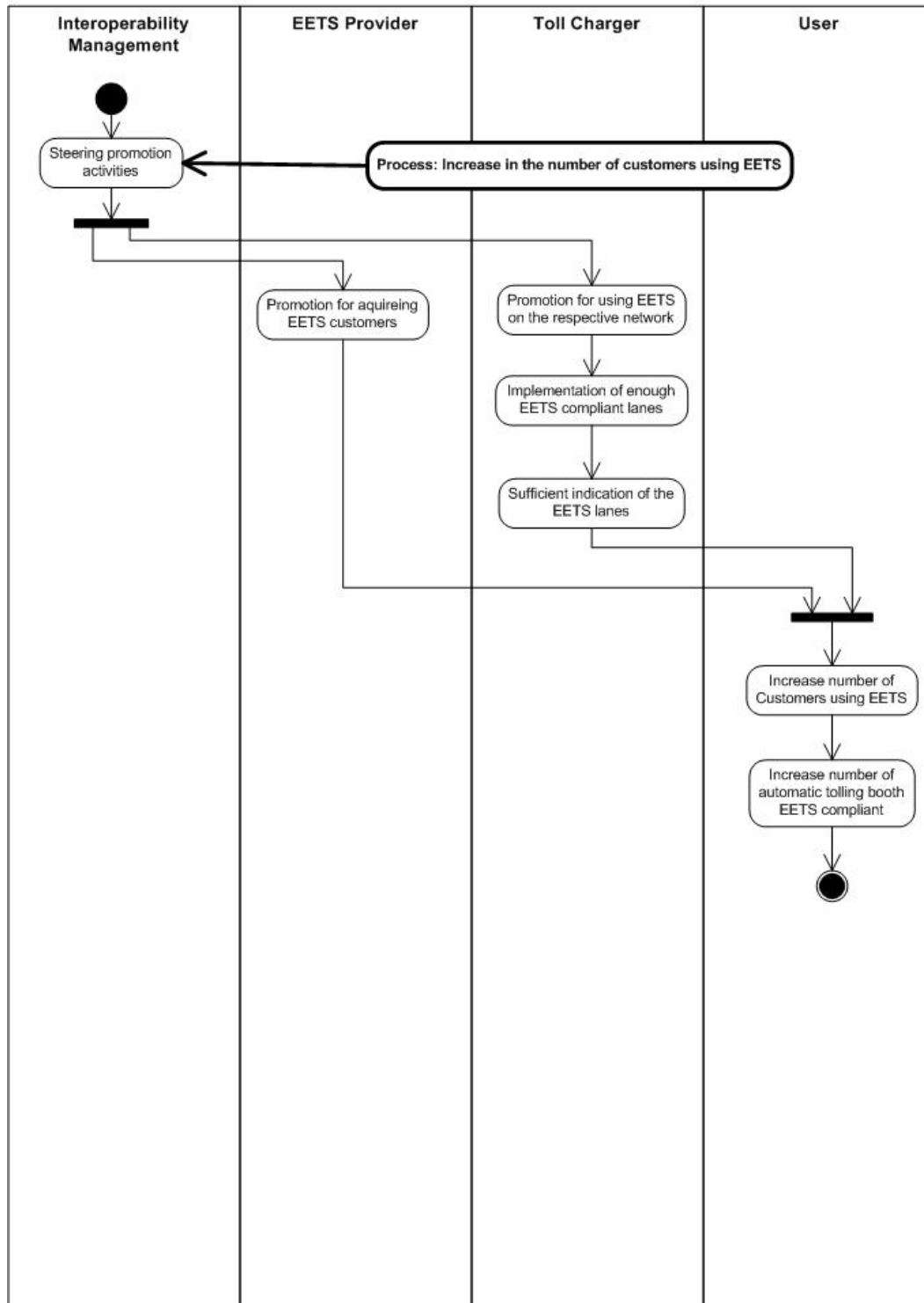
PR02 - Increase in the number of Users using EETS



Procedure and message that shall be standardised within EETS →



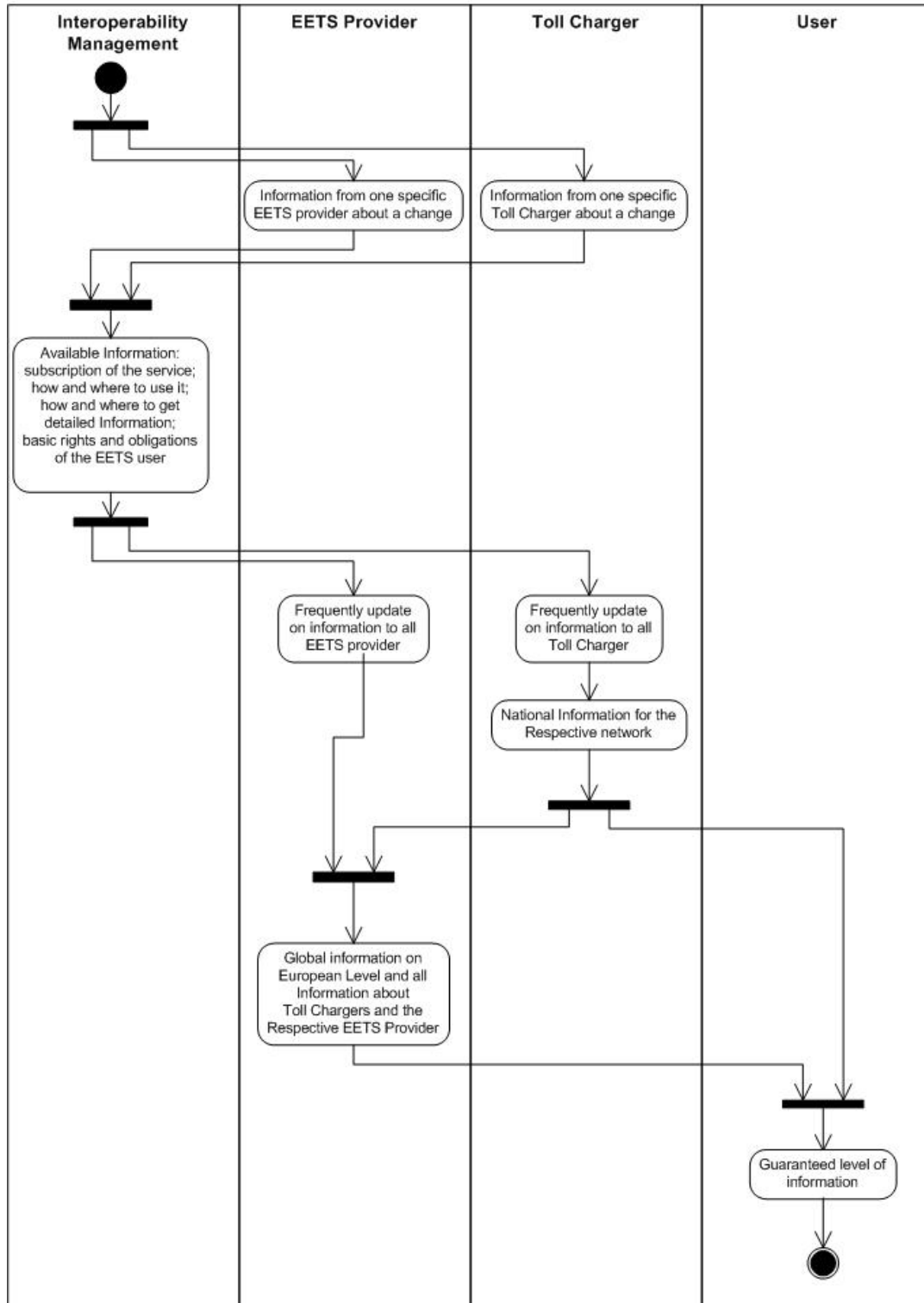
PR03 - Increase in the number of automatic tolling booths EETS compliant



Procedure and message that shall be standardised within EETS →



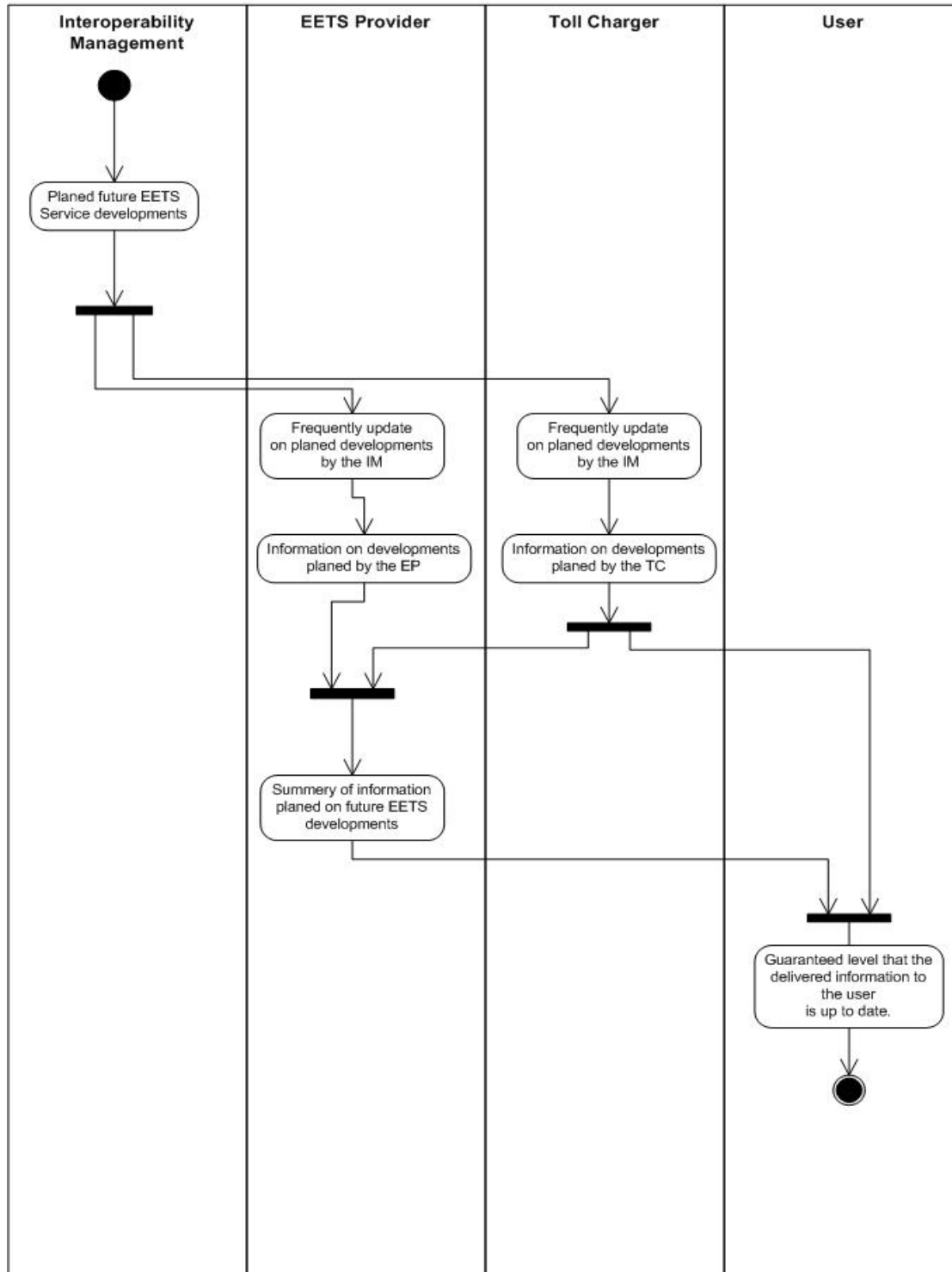
PR04 - Dissemination of information to Users regarding service basic rules



Procedure and message that shall be standardised within EETS →



PR05 -Information to EETS players, and specifically to Users on future EETS Service developments



Procedure and message that shall be standardised within EETS →



2.8.3 Description of the related procedures

PROMOTION	Main objective	Quality requirements	Actors involved	Initialization event	Finalization event	Activities included	Data elements / messages format	Communication	Time and frequency	Security measures	How to handle errors and failures
PR1 - Implementation of the EETS Service	Speeding up the implementation process	Performed realization / time of realization	IM, EP and TC	Final decision in the to start with the implementation of the EETS Service	Implementation performed	See activity diagram	-	Clear communication between IM and TC necessary	As soon as possible after successful decision to start	-	-
PR2 - Increase in the number of users using EETS	Increase the acceptance and use of EETS of the users	Number of users using the EETS service	EP and US, IM and TC for the coordination of a successful promotion in the respective systems	Start of the EETS Service	Maximum possible number of users using EETS achieved	See activity diagram	-	Clear communication between EP and US necessary. TC should be supported by the EP.	As soon as possible after start of the EETS service.	-	-
PR3 - Increase in the number of EETS compliant automatic tolling booths	Increase of tolling systems or lanes which are able to handle the EETS service	the relative number of EETS users to automatic tolling booths which are EETS compliant. Time to perform an EETS transaction, by the user, at tolling booths.	TC and US, IM and TC responsible for the EETS conformance of the tolling booths by the TC (if existing).	Start of the EETS Service	Maximum possible number of users using EETS achieved	See activity diagram	-	Clear communication from the IM to the TC to equip the system with the EETS relevant components.	As soon as possible after start of the EETS service.	-	-
PR4 - Dissemination of information to users regarding service basic rules	Sufficient information level for US about the EETS.	Level of information of US and TC. Inquiries from US to the TC or EP about usage of the EETS service	IM, EP, TC and US. Information flow from IM and TC to US.	Planned changes by the IM, EP and TC. The frequency of the information to be provided should ideally be defined before the start of the EETS Service.	A steady increase in the number of users using EETS is realized, with an agreed basic set of information criteria for the benefit of the US	See activity diagram	-	Clear and understandable Communication between IM and US using a variety of medias. Support of the US by the TC.	A time frequency which has to be defined before the start of the EETS Service. Availability of sufficient information in the operational phase of the EETS service	-	-
PR5 - Information to EETS players and specifically to users on future EETS service developments	Update of the information level from US and TC of the planned developments regarding the EETS service	Level of information of US and TC. Inquiries from US to the TC or EP about usage of the EETS service	IP, TC and US. IP has to inform the other parties about planned activities.	Start of the EETS Service	Updated procedures for as long as the EETS service is in operation.	See activity diagram	-	Communication over commonly agreed communication platforms to ensure a clear information flow to the different actors.	As soon as possible after start of the EETS service. Availability of sufficient information in the operation phase of the EETS service	-	-