**Annex E (Technical Conditions)**

Annex to the EETS Domain Statement concerning the Danish Kilometer Tolling Scheme

Version: 1.0

Date: 24 November 2023

TABLE OF CONTENTS

## 1 DOCUMENT HISTORY

| | |
|---|---|
| Date of first appearance of this entry into the register | 1 February 2024 |
| Last update | 24 November 2023 |
| Next review | Fourth quarter 2024 |

## 2 DEFINITIONS AND ABBREVIATIONS

All definitions in the EETS Domain Statement shall have the same meaning in this Annex.

In addition to the definitions in the EETS Domain Statement the following definitions shall apply for this Annex:

"**Exception Lists**" means the White Lists (only containing valid OBE) and Black Lists (not valid OBE) shared between the EETS Provider and the Toll Charger.

"**OBE Type 1**" means the complete set of hardware and software components to be used as part of the toll service which is installed or carried on board a vehicle in order to collect, store, process and remotely receive/transmit data enabling toll collection on the KmToll Domain and is compliant with EN 12813:2019 and EN 15509:2023 along with OBE Type 1 requirements defined in this document.

**"OBE Type 2**" means the complete set of hardware and software components to be used as part of the toll service which is installed or carried on board a vehicle in order to collect, store, process and remotely receive/transmit data enabling toll collection on the KmToll Domain and is compliant with OBE Type 2 requirements defined in this document – see section 6.3. In contrast to OBE Type 1, OBE Type 2 does not set a requirement for DSRC technology to be part of the OBE.

**"EETS Provider (EP)"** means an entity which under a separate contract, grants access to EETS to an EETS User, transfers the Tolls to the relevant Toll Charger, and which is registered by its Member State of establishment. The EETS Provider can also be referred to as a "**Toll Service Provider (TSP)"** in this Annex.

## 3 INTRODUCTION

This Annex contains the technical conditions applicable for the EETS Provider under the KmToll Scheme. The Annex contains the Toll Charger's EETS Domain specific requirements concerning technical standards, technical conditions, business processes, OBE requirements and technical relation to interfaces described in Annex F (Interface Specifications).

Reading this Annex the EETS Provider will obtain the necessary knowledge on technical requirements and conditions of the Toll Charger in order for the EETS Provider to provide EETS to the EETS User and comply with technical requirements and regulations required by the Toll Charger.

The next sections of this Annex are structured as follows:

(i) **Section 4**: In this section, a general description of the system architecture and interfaces between the Toll Charger and the EETS Provider is provided;

(ii) **Section 5:** In this section, information related to applicable technical standards are described;

(iii) **Section 6:** In this section, the Toll Charger's requirements towards OBE types are described;

(iv) **Section 7:** In this section, information related to Exception List handling are described;

(v) **Section 8:** In this section, information related to data transfer mechanism are described; and

(vi) **Section 9:** In this section, the Toll Charger's security requirements are described.

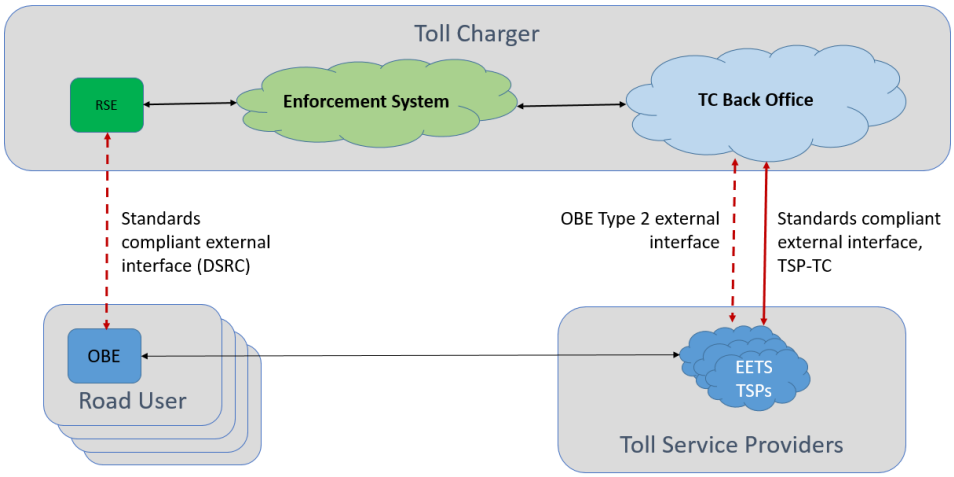
## 4 SYSTEM ARCHITECTURE AND INTERFACES

The architecture of the KmToll Scheme is designed to facilitate and comply with EETS. The figure and description below outline how the EETS Provider is expected to interface with the Toll Charger.

Figure 1 below illustrates a simplified system architecture of the KmToll Scheme. Interfaces between the Toll Charger and the EETS Provider are shown in red. The interfaces defined in this Annex and further defined in detail in Annex F (Interface Specifications) are:

- A Tolling Interface between the TSP and the TC for the exchange of tolling-related data (toll declarations, exceptions lists, billing details etc.).
- An Enforcement Interface between the OBE in a toll-liable vehicle and the Roadside Equipment of the Enforcement system (DSRC) related to OBE Type 1 (EN/ISO 12813:2019) and if an OBE Type 2 is offered, an OBE Type 2 external interface (which is not defined in applicable standards but specified separately by TC) related to compliance check data used in TC's enforcement processes. Both marked with a dotted red line in the figure.

**Figure 1.** Simplified System Architecture




The contents of the interfaces are defined in Annex F (Interface Specifications).

The KmToll Scheme is a Toll Charger dominant scheme meaning that toll calculation takes place centrally in TC Back Office. To aid the EETS Provider in providing information regarding toll liability to the EETS User. The Toll Charger will within the Billing Details, list the tolled road segments, price and details along with a link to an interactive map viewer that the EETS Provider can, if they wish, expose to the EETS User. The interactive viewer will allow the EETS User to explore the Billing Detail in a visual manner on a map in order to understand and inspect the toll charged. The interactive map will be available for 12 months after the Billing Details is forwarded to the EETS Provider.

For further detail on toll differentiating vehicle characteristics; weight and CO2 class see Annex F (Interface Specifications) and related applicable technical standards. The attribute vehicle weight is also described in section 6.1.4. The vehicle CO2 class – euCO2EmissionClass - attribute will be used as required in the Eurovignette Directive. It is identified in prEN 16986:2023 by the type Co2Class, and in the associated XML Schema Profile by the element euCO2EmissionClass and type EuCO2EmissionClass, which is coded as an integer. **Note** that this field is not included in the current version of ISO 12855. Further details on how to determine a vehicle's CO2-class will be provided once published by the Danish authorities following the Eurovignette Directive.

## 5 APPLICABLE TECHNICAL STANDARDS

All interfaces relating to the exchange of tolling data must be compliant with the standards identified in the EETS Directive (EU) 2019/520, Commission Delegated Regulation (EU) 2020/203 of 28 November 2019, and Commission Implementing Regulation (EU) 2020/204 of 28 November 2019. The solution must in addition ensure that all data required to comply with the Eurovignette Directive 2022/362 are exchanged.

It shall be noticed that a number of standards referred to are under revision or recently approved which will lead to or has led to revision of the versions referred to in the directives. As the KmToll Scheme is going to start operation in 2025 the system will be based on the latest available standard in 1st Quarter 2023. If not all applicable standards are approved there may be reference to standards with a prEN status.

In addition to the standards mentioned in the directives a number of standards mentioned in the referred standards are applicable.

The data exchange between Toll Charger and EETS Provider is divided between categories where different standards are relevant:

- Road Side Equipment (RSE)/On-board Equipment (OBE) – where the purpose is to identify that the OBE function according to requirement. Detailed in section 5.1 and section 6.2.
- Data exchange between the Toll Charger's and EETS Provider's back office – where the purpose is to ensure that the data necessary to charge for road usage and perform financial settlement are available timely. Detailed in section 5.2.

### 5.1 RSE/OBE Communication

OBE Type 1 communications between EETS User's On-board Equipment and the Road Enforcement System shall be compliant with standard EN ISO 12813:2019 and EN 15509:2023 provided that the OBE facilitates DSRC data exchange as OBE Type 1.

OBE Type 2 does not require DSRC based communication for CCC communication at the RSE. For the EETS Provider to provide an OBE Type 2 solution to the EETS User in the KmToll Domain the Toll Charger require the EETS Provider to establish and implement a CCC data request and response mechanism. The purpose of the back-end based CCC communication – which is an interface between Toll Charger's back-office and the EETS Provider's back-office – is to simulate a similar CCC transaction enabling efficient enforcement processes. The Toll Charger will, once a whitelisted OBE Type 2 vehicle is identified at the road side, send a CCC data request according to the defined CCC data interfaces in Annex F (Interface Specifications).

### 5.2 Data exchange between the Toll Charger and EETS Provider

Communication between the back-offices of the Toll Charger and of the EETS Provider shall be compliant with prEN 16986:2023, except where specifically identified. It is recognised that prEN 16986:2023 is currently still in draft form (identified by the "pr" prefix). It is anticipated that during the course of implementation of the KmToll Scheme, the standard will be ratified, and if possible, this ratified version will be used. See Annex F (Interface Specifications) for more details on the use of EN 16986. In this document, references to EN 16986 should be taken to mean prEN 16986:2023.

The standard defines a number of profiles, covering different tolling solutions. The KmToll Scheme will use the SectionAutonomous profile with Toll Charger (TC) dominance. This means that section 8, 10 and 11 of the standard are not relevant.

The following interfaces between the EETS Provider's back-office and the Toll Charger's back-office will be required;

- Acknowledgements (both directions)
- Exception Lists (four separate interfaces for the four different list types)
- Contract Issuer List
- Toll Declarations
- Payment Claims
- Payment Announcements
- Billing Details
- Report Abnormal OBE
- CCC Data Request
- CCC Data Response
- Trust Objects
- Actor Table exchange

All the above interfaces other than Trust Objects and Actor Table Exchange will be implemented as REST (Representational state transfer) APIs. See section 8 for further detail on back-office interfaces.

Data will be exchanged in the sequence as defined in EN 16986 to perform toll calculation and collection. Toll Declarations must be forwarded from the EETS Provider to the Toll Charger in a rapid manner, as fast as possible, allowing toll to be calculated shortly after driving on the road-network. The Toll Charger requires the EETS Provider to send Toll Declarations in a continuous manner as soon as Toll Declarations are available and not in bulk. See section 6.1 for more details. This is governed by KPIs defined in Annex G (Key Performance Indicators) and no later than six (6) months after the GNSS data is recorded.

### 5.3 Time and Date

Date and time information is coded as defined in ISO 8601, using the GeneralisedTime format. Time is reported to the nearest second. As ISO 8601 allows different levels of representations and precision, the exact format used is as defined in ISO 12855:2022 and its annexes. This is also reflected in the interfaces defined in Annex F (Interface Specifications). Wherever time is stored in any part of the KmToll system, or where time is transferred between systems, the time must be in UTC, not local time.

**Note** that this does not define how time is presented to the EETS User, which will generally be done in local time. This means that time shown to the EETS User on computer screens, invoices, bills etc. must be shown in local Danish time. Where the EETS User need to input time (for example on toll ticket interfaces), this must also use local Danish time.

## 6 OBE REQUIREMENTS

On the KmToll Domain two types of OBEs are allowed:

1. OBE Type 1 – a GNSS capable OBE including DSRC and compliant with ISO 12813:2019 and EN 15509:2023; and
2. OBE Type 2 – a GNSS capable OBE.

Requirements towards each of the two types is detailed in the below sections. Section 6.1 define requirements applicable for both types of OBE. Section 6.2 define requirements specific to OBE Type 1. Section 6.3 define requirements specific to OBE Type 2.

The EETS Provider must clearly state which type of OBE it is in the Contract Issuer List according to ISO 12855:2022 & EN 16986.

## 6.1 General OBE requirements

The OBE must comply with (EU) 2020/203 Annex II and (EU) 2020/203 Annex I based on the approved standard, however, compliance will be reduced slightly for OBE Type 2 based on the nature of OBE Type 2, see section 6.3.1.

The OBE must be able to obtain high quality and precise GNSS locational data – standard GNSS coordinates WGS84 - within the geographical area of Denmark with a frequency of 1 position point per 5 seconds and send it continuously over mobile cellular network, or other data connection, to the EETS Provider's back-office enabling the EETS Provider to send Toll Declarations to the Toll Charger according to the requirements in Annex F (Interface Specifications).

The Toll Declaration shall contain sufficient position data before entering the KmToll Domain and after leaving the KmToll Domain for the Toll Charger to be able to unambiguously identify that the border was crossed and the point at which it was crossed. The volume of position data outside the KmToll Domain for this identification must be as low as possible.

In case the OBE loses back-office connectivity, the OBE must be able to continue to operate and collect data for a minimum of one (1) Days. When the storage capacity of the OBE runs out following minimum one (1) Days of operations without back-office connectivity the OBE must stop operating and turn to status 2 as defined in section 6.1.2. As soon as mobile cellular network or another data connection is re-established all stored data in the OBE must be sent to the EETS Provider's back-office from where it is forwarded to Toll Charger as soon as possible.

6.1.1 **Note** Each Toll Declaration contains GNSS data covering a time span of 5 minutes starting at the first GNSS locational data recorded and passed to the Toll Charger continuously. In case driving of 16 minutes is recorded the resulting number of Toll Declarations will be 4. Covering data collection driving past midnight is not to be split into two packages by the EETS Provider – the Toll Charger will handle midnight cases where the data will be split into two Billing Details.

### 6.1.2 Distinguishing OBE type

In order to undertake enforcement processes for OBE Type 1 and OBE Type 2 the OBE type must be clearly distinguishable listed on the Contract Issuer List using the attribute typeOfEfcApplication and as required according to interface specifications in both the Toll Declaration and Exception Lists.

**Note**: See release notes on interfaces for details.

### 6.1.3 Personalisation of OBE

All OBE must be initialised by the EETS Provider prior to use by ensuring accurate OBE personalisation.

The EETS Provider is allowed to perform personalisation of the OBE and change to personalisation over-the-air (OTA).

All toll rate relevant parameters of the vehicle description – Vehicle Class, Vehicle Weight Limits and Vehicle CO2Class – are by default of static nature and not dynamic – which only the EETS Provider is allowed to initially set and change in the OBE.

No dynamic vehicle information such as vehicle axles is used for toll calculation, and it is therefore not a requirement that the EETS User configure and maintain dynamic vehicle information.

### 6.1.4 Man machine interface (MMI) elements of the OBE

The OBE shall have at least the following user interface elements to fulfil the required functionality:

- An optical element

The optical element shall visually indicate as minimum the following information required for the use of the OBE in the KmToll Domain:

- The operational status of the OBE

The indication of the operational status of the OBE shall have at least the following states:

**Table 1.** OBE minimum operational status indicators

| State | Operational status indication to the OBE user |
|---|---|
| State 1 | The OBE is working correctly in the KmToll Domain |
| State 2 | The OBE is not working correctly in the KmToll Domain |

The EETS Provider is allowed to incorporate additional states provided that the EETS User is clearly instructed in the use and meaning of each state – preferably using an intuitive coloured indicator scheme (State 1 could be green, State 2 could be red).

State 1 and State 2 must be used in relation to the OBE status (attribute OBEstatusHistory).

Visibility requirement related to the operational status of the OBE differ between OBE types, see section 6.2 and 6.3.

**Note** on acoustic MMI element: No acoustic information signal shall take place in relation to the communication between RSE and the OBE. This is to be supported by SET-MMI codes when passing an RSE. SET-MMI code 255 will be used so the buzzer provide 'no beep'. 'No beep' is applied for road safety reasons and as DSRC communication is solely used for enforcement purposes.

Acoustic MMI element is allowed for other purposes like informing the user about OBE malfunction or similar.

### 6.1.5 Requirements to data sets in OBE

The required data described in this section must be in the OBE (personalisation) and identically in the Toll Declarations originating from the OBE when sent to the Toll Charger by the EETS Provider according to Annex F (Interface Specifications).

Data definitions follow EN 12813:2019 while further details and requirements to specific attributes is highlighted below the table:

**Table 2.** Required data sets in OBE

| Attribute | Reference to 12813:2019 EFC attributeID |
|---|---|
| CCC-ContextMark | 0 |
| EquipmentOBUID | 24 |
| PaymentMeans | 32 |
| OBEStatusHistory | 53 |

| | |
|---|---|
| VehicleLicensePlateNumber | 16 |
| VehicleClass | 17 |
| VehicleWeightLimits | 20 |

The following sections provide in-depth notes to attributes defined in EN 16986 relevant for the KmToll Scheme.

**Attribute 0: CCC-ContextMark**

OBE Type must be clearly distinguishable both when read by RSE and listed on Exception Lists.

For the purpose of distinguishing OBE types CCC-ContextMark attribute and Payment Means attribute as stated on the Contract Issuer List will be used.

The Contract Issuer List from EETS Provider must for each entry include information stating type of OBE and version of OBE.

Each type/version must be supplemented by detailed information describing each OBE type and version in order to access the equipment (new or update).

The EETS Provider must inform the Toll Charger clearly based on the CCC-ContextMark and Payment Means which type of OBE it is.

**Attribute 24: EquipmentOBUId**

The EquipmentOBUId shall be a unique identification number assigned to OBE by the manufacturer during the production process.

The PAN identify a specific OBE e.g., for blacklisting purposes (together with the ManufacturerId, submitted in VST).

If the attribute EquipmentOBUID is shorter than 4 Byte (+1 Byte length indicator), it is rightpadded with 0'B to achieve the desired length of 4 Bytes.

**Attribute 16: VehicleLicensePlateNumber**

This attribute is holding information about the vehicles licence plate content (LPN) and the registering country. The licence plate information can have up to 14 characters acc. To EN 15509:2023.

The license plate information shall always be padded with NULL characters after the last character to achieve the total length indicated by the length determinant.

For the LPN only Latin Alphabet No. 1 (according to ISO 8859-1) upper case letters and numbers (without any spaces and hyphens) shall be used.

Non-Latin Alphabet No. 1 characters used in an LPN (i.e., characters from ISO 8859-2 Latin Alphabet No. 2 and ISO 8859-5 Latin/Cyrillic alphabet) shall be coded as lower-case letters applying the translation table from Annex E of EN ISO 14906 [EFC API].

**Attribute 17: VehicleClass**

The attribute VehicleClass may hold information about trailer presence, the value for European vehicle Group.

The letter N2, N3 on the vehicle registration certificate may be determined based on the maximum permissible weight (F.2) which may lead to a weight just below the limit.

**Table 3.** Vehicle classification attributes

| EN 15509:2023 European Vehicle Group (Byte 1) | | Comment |
|---|---|---|
| 0 | No entry | |
| 1 | Group 1 - Small passenger vehicles (UNECE class M 1) | M1 (See note 1) |
| 2 | Group 2 - Light Goods Vehicles (UNECE class N 1) | N1 (See note 2) |
| 3 | Group 3 - Large passenger vehicles (UNECE class M 2, M 3) | M2, M3 (See note 3) |
| 4 | Heavy Goods Vehicles up to 12 T (UNECE class N 2) | |
| 5 | Group 5 - Heavy Goods Vehicles over 12 T (UNECE class N 3) | |
| 6 | Group 6 – Motorcycles (UNECE class L) | |
| 7 | Group 7 - Other vehicles including vehicles above 3,5 T not included in previous groups | See note 4 |

Note 1: Assumed to be ≤3.5 tons, otherwise assigned to group 7

Note 2: Assumed to have 2 axles, otherwise the vehicle is assigned to group 7

Note 3: Assumed to be >3.5 tons Note that a few of these vehicles may be ≤3.5 tons

Note 4: Any vehicle not defined in European Vehicle Groups 1- 6. This includes small passenger vehicles weighing more than 3.5 tons.

**Attribute 20: VehicleWeightLimits**

The attribute VehicleWeightLimits is holding information about vehicle weight limits acc. to ISO1176.

VehicleWeightLimits has three data elements as defined in ISO14906. The data elements VehicleMaxLadenWeight and VehicleTrainMaximumWeight must be provided. For vehicles which do not have the capacity to tow a trailer the VehicleTrainMaximumWeight must contain the same value as VehicleMaxLadenWeight.

The field VehicleMaxLadenWeight will contain the value the maximum technical weight of the complete vehicle (F.3), as defined in ISO 1176. It shall be reported in 10kg units, rounded down to the next 10kg step.

## 6.2 OBE Type 1 specific requirements

The OBE Type 1 must be able to communication in a multilane environment with overlapping communication zones using different RF-channels. The performance of the OBE must not decrease due to the multilane free-flow functionality or disturb multilane RSE when transmitting.

The optical information elements related to operational status shall be easily visible at all times.

The OBE Type 1 must support CEN compatible DSRC communications at 5.8 GHz and must conform with EN 15509:2023 and EN 12813:2019. Related to EN 15509:2023 DSRC security profile 1 shall be supported.

The following standards apply for OBE Type 1:

- EN 14906:2023 - Application Interface for EFC
- EN 15509:2023 – Interoperability application profile for DSRC
- EN 12813:2019 - CCC for autonomous systems

### 6.2.1 DSRC based CCC transaction

When performing a transaction between RSE and OBE Type 1 the following must be supported and transmitted upon request from Toll Charger's RSE:

**Table 4.** CCC transaction attributes

| Attribute | Attribute ID | Length | Data set |
|---|---|---|---|
| CCC-ContextMark | 0 | 6 | Identification |
| EquipmentOBUId | 24 | 5 (1+4) | Identification |
| PaymentMean | 32 | 14 | Identification |
| OBEStatusHistory | 53 | 23 | Status |
| VehicleLicencePlateNumber | 16 | 13 to 17 | Vehicle |
| VehicleClass | 17 | 1 | Vehicle |
| VehicleWeightLimits | 20 | 6 | Vehicle |

The CCC transaction attribute list above is an extract from the CCC attribute list as defined in ISO14906, EN 15509:2023 and ISO/TS 17573-3 where they are defined.

**Note** that the CCC transaction attributes in Table 4 correspond to attributes listed in Table 2. While Table 2 define data set required in the OBE, Table 4 defines the attributes which must be supported for DSRC transmission and specific length and data set according to the standard.

## 6.3 OBE Type 2 specific requirements

OBE Type 2 constitutes an OBE type which is not governed by standard EETS OBE requirements. The core purpose of OBE Type 2 is to enable GNSS based tolling identically to OBE Type 1, however without the requirement of a DSRC module. OBE Type 2 allows for a wider range of hardware and software combinations – also where the EETS Provider provide the application software enabling the OBE running on hardware that the EETS User provide themselves either as a separate hardware unit or as part of a unit used for other technical purposes as well.

The Toll Charger's specific requirements to OBE Type 2 are:

- The OBE Type 2 must comply with general OBE requirements listed in section 6.1 of this Annex – hence be fit-for-purpose; collect GNSS locational data and enable toll collection.
- The OBE Type 2 must allow the EETS User to undertake toll data collection effectively while driving on the road without imposing a personal or traffic safety risk, while also complying with relevant road regulations. The EETS Provider must clearly guide and instruct the EETS User on how to operate the OBE to ensure that it is fit-for-purpose during operation.
- In case the EETS Provider only provides the software as part of OBE Type 2 the software application must be designed to be robust against changes to OS platform as well as hard-ware updates the application is run on. A software based OBE Type 2 can only operate on OS platforms still subject to current security updates.
- The OBE Type 2 must allow and aid the EETS User to easily operate the unit and start toll data collection when starting to drive on the KmToll Domain.
- An optical information element related to operational status shall be easily visible when the application is in use and displayed as a highlighted element as part of applicable notification services as notification center, lock-screen or home screen or similar when the OBE Type 2 is activated making it easily interpretable to the user if data collection for tolling purposes is active or not.
- The OBE Type 2 must optically display at least the following information; operational status, OBE Type 2 version information and OBE personalisation information clearly to the user while in use.

- The OBE Type 2 must not allow the EETS User to change toll dependent vehicle characteristics directly on the unit.
- The OBE Type 2 must be designed to notify the EETS User in case required external signals (GNSS, mobile cellular or similar) are lost during operation and notify the EETS User clearly about the consequence loss of signal have in relation to toll collection.
- The OBE Type 2 must be designed to notify the EETS User in case required external power or battery on the unit is not sufficient for operation and notify the EETS User clearly about the consequence of insufficient power have in relation to toll collections.
- The EETS Provider must ensure that the Toll Charger can identifier OBE Type 2 as an OBE Type 2 by the EFC-Contextmark and Payment means attribute and Contract Issuer List. See requirements in section 6.1.3 about attribute 0.

### 6.3.1 OBE Type 2 specific CCC transaction

DSRC communication capabilities is not a requirement for OBE Type 2. Therefore, the function of the CCC data communication must be enabled through other means. This will be through CCC data request and response interfaces as described in section 8 in order to verify OBE compliance when an OBE Type 2 whitelisted vehicle is detected at an enforcement point based on vehicle license plate identification.

OBE Type 2 CCC data communication will take place on request by the Toll Charger when an enforcement case for a known OBE Type 2 user must be qualified. As specified in Annex F (Interface Specifications) a CCC Data Request and CCC Data Response interface must be implemented if the EETS Provider seeks accreditation and wants to operate with an OBE Type 2. The process that the interface is to support is to allow the Toll Charger to obtain CCC data for an OBE Type 2 based on road enforcement observations with a specific time and date.

The CCC data request from the Toll Charger to the EETS Provider can take place shortly after the road enforcement observation of a known OBE Type 2 user. The EETS Provider is allowed 15 minutes to respond to a CCC data request from the Toll Charger through the CCC data response. In case the EETS Provider does not have CCC information within this time, it must respond with "unavailable". The Toll Charger will request the CCC data again 24 hours later.

Based on the CCC data request the EETS Provider is to respond with the data required in the interface specification of the CCC data response. The GNSS location field must be reported to the last known GNSS location at the date and time of the enforcement case as requested in the CCC data request.

The EETS Provider is required to store and maintain OBE Type 2 usage and status history enabling a CCC data exchange following a request from Toll Charger up to 90 Days.

**Note:** The CCC Data Request and CCC Data Response interfaces are only required to be implemented if the EETS Provider seeks accreditation of OBE Type 2 and operate with OBE Type 2 as a product offering to their customers.

### 6.3.2 OBE Type 2 specific accreditation documentation

When seeking OBE Type 2 accreditation the EETS Provider must provide a list of OS platform(s) and versions on which the OBE Type 2 can operate, along with a list or description of hardware characteristics on which the OBE Type 2 run providing insights into the hardware types the OBE type 2 designed for.

Reaccreditation of OBE Type 2 will be required in case of changes to OS platform or other fundaments of the OBE Type 2 changes unless the EETS Provider can document – based on a risk based assessment - that changes and updates do not affect the fundamentals on which the OBE Type 2

accreditation is conducted and do not compromise precision and operational liability of the OBE Type 2.

For accreditation purposes it should be noted that the following requirement of EETS Commission Implementing Regulation (EU) 2020/204 do not apply:

- Annex I, clause 1
- Annex III, Module A, (a) (ii)
- Annex III, Module A, (a) (iii) – "drawings" is to be subtracted from the requirement

## 7 EXCEPTION LIST HANDLING

Exception Lists are exchanged between the EETS Provider and the Toll Charger with the purpose of the EETS Provider to state and identify the OBE issued to the EETS User on which the EETS Provider guarantee toll payment as the OBE is used on the KmToll Domain.

The EETS Provider has to provide Exceptions Lists in form of both a White List and Black List to the Toll Charger on a regular basis according to the frequency requirements stated below:

**Table 5.** Exception list - transfer

| Exception List type | Full list transfer | Incremental list update transfer |
|---|---|---|
| White List | Once daily at no later than 23.59, 365 days a year<br>(transfer can start at 20.00) | Allowed any time during the day, however maximum 500 incremental list per hour<br><br>One entry is allowed per incremental white list. |
| Black List | Once daily no later than 04.00, 365 days a year<br>(transfer can start at 00.00) | Allowed any time during the day, however maximum 500 incremental list per hour<br><br>One removal is allowed per incremental black list. |

The EETS Provider must transfer the full White List in latest and most updated version once daily before 23.59 – transfer can start at 20.00. The EETS Provider has to transfer the full Black List in the latest and most updated version once daily before 04.00 – transfer can start at 00.00. Incremental White Lists and Black Lists are allowed at the frequency preferred by the EETS Provider, but maximum 500 incremental lists per hour. Incremental lists are used by the EETS Provider to add one OBE to the KmToll Domain in between the daily full list transfer. Removal of OBE from the Black List is allowed on an incremental basis enabling reactivation of OBE.

Dominant Exception List rules:

- Newly transferred full lists will overrule all previously transferred lists.
- Black Lists will overrule White Lists.

Allowed entries on incremental lists:

- Incremental White List – only adding OBE to the White List is allowed.
- Incremental Black List – only removal of OBE from the Black List is allowed.

**Note**: In case the EETS Provider fail to deliver a new daily full list the last received full list along with incremental lists will remain valid. A partially received full list will be rejected and not implemented for tolling purposes at the Toll Charger level. The EETS Provider can, depending on error massages, resend the part (chunk) of the list failing within the timeframe window for sending the full list. see table 5.

It is the responsibility of the EETS Provider to ensure that the Toll Charger has the correct Black and White Lists available at all times. The Toll Charger will ensure that incremental lists entries are merged with full lists.

## 7.1 Time of validity

Validity of Exception Lists is determined by the time of acknowledgement of list transfer by the Toll Charger according to Annex F (Interface Specifications). **Note** that the field entryValidityStart is supported and must be used. For White Lists and Black Lists the time of validity is specified below:

**Table 6.** Exception List - validity

| Exception List type | Time of validity |
|---|---|
| White List | Valid from the moment where list transfer is acknowledged by the Toll Charger. |
| Black List | Adding to the Black List:<br>Valid from 00.00 on the next day after the list transfer is acknowledged by the Toll Charger.<br><br>Removing from the Black List:<br>Valid from the moment where list transfer is acknowledged by the Toll Charger. |

## 7.2 Whitelisting

Adding an OBE takes effect immediately after the transfer of the White List is complete and acknowledged by the Toll Charger if the OBE is not on the Black List.

Therefore, the EETS Provider must remove an EETS User from the Black List before or at the same time as adding to the White List. The Black List overrules the White List.

If the EETS Provider for some reason is not able to remove an OBE from the Black List the EETS Provider must wait with sending Toll Declarations for that EETS User until the removal of the OBE is received and acknowledged by the Toll Charger.

## 7.3 Blacklisting

Blacklisting an OBE – meaning that the EETS Provider choses to block the usage and thereby does not guarantee for toll payment related to the OBE – will take effect at the following day after transfer (running day plus one day). Should the EETS Provider send Toll Declarations for an OBE even though the OBE is effectively blocked, this will still result in Billing Details being sent to the EETS Provider. If the EETS Provider detects that the Toll Declaration has been sent to the Toll Charger by mistake, the EETS Provider shall provide documentation of this, after which the Toll Charger shall loyally cooperate to make the necessary corrections, cf. the EETS Provider Agreement clause 4.3.2.

The EETS Provider must keep a blacklisted OBE on the White List until the moment of validity of the Black List – hence a blacklisted OBE is only to be removed from the next full White List the day after the OBE is added to the Black List. **Note**: Until the validity effective date and time the EETS Provider remains liable for the OBE and must transfer Toll Declarations to the Toll Charger during the period from blacklisting to the moment of validity takes effect.

The EETS Provider must remove blacklisted OBE from the Black List at the time the OBE is permanently disabled or scrapped or no later than 3 months after the OBE is blacklisted. The EETS Provider must not send Toll Declarations for blacklisted OBE or OBE not in service.

If the EETS Provder for some reason is not able to remove an OBE from the Black List the EETS Provider must wait with sending Toll Declarations until the removal of the OBE is received and acknowledged by Toll Charger.

### 7.4 Reactivation of blacklisted OBE

Subsequently if the EETS Provider intend to move an OBE from the Black List to the White List – reactivating the same OBE – the EETS Provider have to (i) remove the OBE from the Black List, (ii) add the OBE to the White List. Once the OBE is whitelisted and not on the Black List the OBE whitelisting is valid and takes effect.

Delay of validity for Black Lists and non-overlapping White Lists and Black Lists allow the Toll Charger to handle Exception Lists in the enforcement process and RSE sequentially. Moreover, it ensures that the EETS User will not be 'cut-off' during use – either intentionally or unintentionally – immediately without the EETS Provider also informing the EETS User in advance.

## 8 DATA TRANSFER MECHANISM

The KmToll Scheme will deviate from the current version of EN 16986 in the choice of data transfer mechanism. A REST API is used as data transfer mechanism instead of SOAP V1.1 or FTP, and the data to be transferred will be coded in JSON, not XML as defined in ISO 12855:2022.

EN 16986 specifies that generic data transfer to use either web services using SOAP V1.2, or FTP – except for transfer of trust objects. Web services using SOAP V1.2 or FTP are not deemed optimal for the data transfer envisaged, so the data transfer mechanism to be used is API. REST has been employed throughout the software industry and is widely accepted for creating stateless, reliable web APIs. Details of the REST API, data formats and coding are defined in Annex F (Interface Specifications). **Note** that data format is JSON.

All data transfer between the EETS Provider and the Toll Charger will use REST, with the exception of trust objects, which will be transferred using a web-based data transferring mechanism bilaterally agreed defined by Toll Charger for the EETS Provider to securely upload trust objects to the road side enforcement system separately, and Actor Table exchanges which will be agreed bilaterally between the EETS Provider and the Toll Charger.

By default, data will be PUSHed from sender to receiver.

Annex F (Interface Specifications) provide the full detail on interface specifications. The below table provide an overview of the interfaces and data to be exchanged:

**Table 7.** Interfaces and data to be exchanged

| Data to be exchanged | Frequency of exchange | Direction |
|---|---|---|
| Ack_TC | Ad-hoc | TSP - TC |
| Ack_TSP | Ad-hoc | TC - TSP |
| Exception Lists | Daily (full lists)<br>Ad-hoc (incremental lists) | TSP - TC |
| Trust Objects | Ad-hoc | TSP - TC |
| Contract Issuer List | Ad-hoc | TSP – TC |
| Toll Declarations | Once every 5 minutes | TSP – TC |
| Payment Claims | Monthly | TC – TSP |

| | | |
|---|---|---|
| Payment Announcements | Monthly | TSP – PC |
| Billing Details | Daily | TC – TSP |
| Report Abnormal OBE | Ad-hoc | TC – TSP |
| CCC Data Request | Ad-hoc | TC - TSP |
| CCC Data Response | Ad-hoc | TSP - TC |
| Actor Table exchange | Ad-hoc | TSP – TC<br>TC - TSP |

## 9 SECURITY

The Toll Charger uses a risk-based approach to information and IT security based on the CIS framework and comply with the ISO 27001 standard. This means that the Toll Charger demand that the EETS Provider and/or third parties to comply with the same requirements and standards.

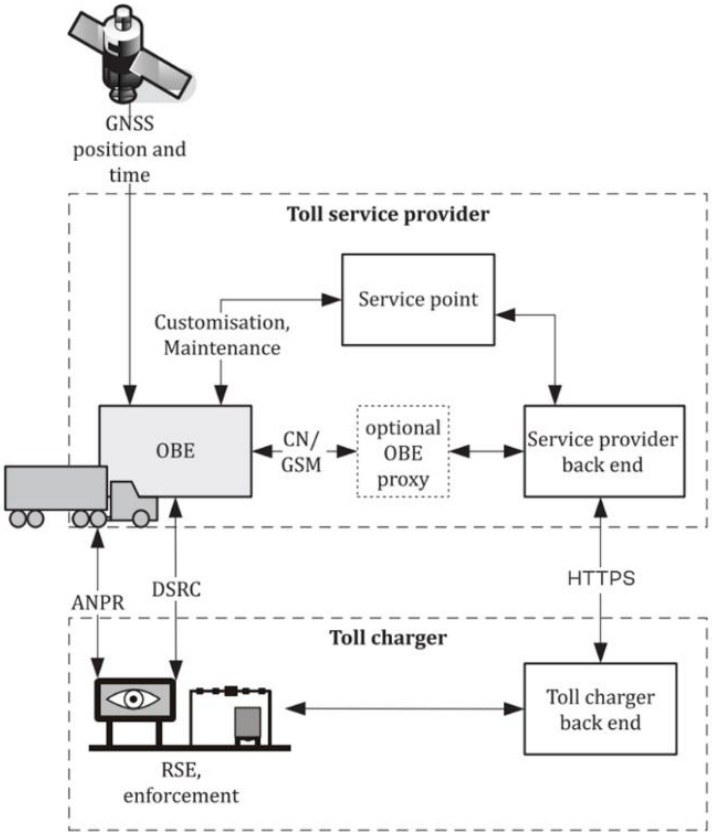
The EETS Provider's solution must comply with ISO 27001:2017 with the requirements stated in ISO 27002:2017 and ISO 19299 Electronic fee collection security framework.

Security and data integrity is a key element addressed in three key areas:

- The EETS Provider's compliance with overall requirements in the EETS Domain Statement;
- OBE Type 1 DSRC security requirements defined in section 5.1; and
- Data interface security requirements defined in Annex F (Interface Specifications) as part of the interface definitions and built in security model.

Note: Main interfaces connection is shown in ISO:19299, see Figure 2. Please note that the interface between the EETS Provider and the Toll Charger is HTTPS.

**Figure 2.** Interface connections between EETS Provider and the Toll Charger




9.1 **Security requirements**

Below are the formalised security requirements that the Toll Charger requires the EETS Provider to comply with in connection with accreditation. The EETS Provider must:

- have internal processes in place that ensures secure handling of data (data processing);
- provide a threat analysis addressing the risks set out in ISO 19299 Annex D;
- have a clear plan for business continuity/disaster recovery;
- actively address and work with patch and vulnerability management; and
- have implemented an Information Security Management (ISM) system.

For the EETS Provider to demonstrate compliance with the above listed security requirements, the EETS Provider shall present the Toll Charger with the documentation defined in Table 3 in Annex C (Accreditation Procedure).