Bonneagar Iompair Éireann
Transport Infrastructure Ireland

Dublin Tunnel EETS Domain Statement

Date: 20 March 2025

Bonneagar Iompair Éireann
Transport Infrastructure Ireland

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General Introduction

1.1 Introduction

This document is intended mainly for European Electronic Toll Service ("**EETS**") providers ("**EETS Providers**") in the context of Directive (EU) 2019/520 of the European Parliament and of the Council of 19 March 2019 on the interoperability of electronic road toll systems and facilitating cross-border exchange of information on the failure to pay road fees in the Union (the "**EETS Directive**").

The EETS Directive was transposed into Irish law on 13 April 2023 by the European Union (Interoperability of Electronic Road Toll Systems) Regulations 2023 (the "**EETS Regulations**").

The purpose of this EETS Domain Statement is to set out the general conditions for EETS Providers for accessing the Dublin Tunnel EETS Domain.

Transport Infrastructure Ireland ("**TII**") is the Toll Charger for the Dublin Tunnel EETS domain to which this EETS Domain Statement applies.

This EETS Domain Statement does not constitute an offer to enter into an agreement. TII reserves the right to make changes to the requirements listed below at any time.

TII may be contacted at:

Transport Infrastructure Ireland,
Head of Interoperability,
Parkgate Business Centre,
Parkgate Street,
Dublin 8,
D08 DK10

If an EETS Provider wishes to provide services on the Dublin Tunnel EETS Domain, it must follow the process set out in section 4 of this document. This includes signing an Accreditation Agreement with the Toll Charger, which sets out the commercial conditions that apply during the accreditation process. The accreditation tests that the EETS Provider must undergo are set out in the EETS Provider Technical Accreditation Procedure (see Appendix A.1 to this EETS Domain Statement).

The national Conciliation Body for disputes regarding the EETS service in Ireland is:

The National Transport Authority
Dún Scéine,
Harcourt Lane,
Dublin 2,
D02 WT20.

Glossary

Term or Abbreviation	Definition
Accreditation Agreement	This agreement provides the terms and conditions which apply during the accreditation process for a new EP applying to provide EETS to the Dublin Tunnel EETS Domain.
Accreditation Certificate	Certificate issued by a TC to an EP indicating that the requirements of the EETS Provider Technical Accreditation Procedure have been met.
ANPR	Automatic Number Plate Recognition.
AVC	Automatic Vehicle Classification.
Black List	List of vehicles and OBUs assigned to a TSP or EP where the associated account is no longer valid, and the TSP or EP will not be liable for payment of the toll. The Black List is provided by the EP or TSP to the IMP.
CCEI	Consolidated Charging and Enforcement Information. This is a file generated by the IMP that contains toll transactions of vehicles on the TSP's White List across each toll point in Ireland during the relevant period of time based on the CEI files issued by each TC. The CCEI file is unique to each TSP or EP and is issued by the IMP to the TSP or EP. This is equivalent to the Billing Details, as defined in the EFC standards.
CEI File	Charging and Enforcement Information file. This file includes relevant details of toll transactions completed by vehicles on each accredited TSP's or EP's ETC White List at the TC's toll point within a specified period of time. It is a single file generated by the TC that contains transactions of all accredited TSPs or EPs and is issued to the IMP for consolidation. This is equivalent to the Toll Declaration, as defined in the EFC standards.
Calendar Settlement Statement (CSS)	Settlement Statement for tolls completed during a calendar month.
Candidate EETS Provider ("**CEP**")	A Candidate EETS Provider is an entity that has registered its interest in providing EETS in Ireland and is yet to complete the accreditation process.
Conciliation Body	The conciliation body is a designated entity responsible for facilitating mediation between Toll Chargers with an EETS Domain located within its territory and EETS Providers that have contracts or are in contractual negotiations with those Toll Chargers. For the purposes of the EETS Regulations and the EETS Directive in Ireland, the National Transport Authority is the designated Conciliation Body.
Consolidated Black List	List produced by the IMP containing the Black List data from all TSPs and EPs.
Consolidated White List	List produced by the IMP containing the White List data from all TSPs and EPs.
DSRC	Dedicated Short Range Communication.
Disability Toll Exemption Scheme ("**DTES**")	DTES was set up by TII in 2019 to exempt disability modified vehicles from tolling charges on Irish toll roads.
EETS Directive	(EU) Directive 2019/520 of the European Parliament.
EETS Domain	A road section or item of road infrastructure where some classes of vehicles are required to pay a toll to use it.
EETS Domain Statement	Statement required for every EETS Domain under S.I. No. 178 of 2023 clause 19.

Term or Abbreviation	Definition
EETS Provider ("**EP**")	The EETS Provider is an entity registered with their national government as an EETS Provider which allows EETS Users to pay for toll services on EETS Domains through their accounts. The EETS Provider may only offer EETS services in a EETS Domain after successfully completing the accreditation process and agreeing commercial arrangements with the Toll Charger.
EETS Provider Technical Accreditation Procedure	This document (a copy of which is appended to this Dublin Tunnel EETS Domain Statement) sets out the technical requirements and tests for accreditation of an EETS Provider.
EETS User	A person who has a contract with an EETS Provider in order to have access to the EETS.
Electronic Toll Collection ("**ETC**")	This involves the electronic detection of the passage of a vehicle using detection equipment at the toll point and a device mounted in the vehicle or other means of uniquely identifying the vehicle such as the licence plate.
ETC Service User	Road users who have registered for an account with a TSP.
Free-Flow Tolling ("**FFT**")	Tolling without barriers.
Interoperability Framework Agreement ("**IFA**")	The Interoperability Framework Agreement is a multi-lateral agreement between TCs, TSPs or EPs and the IMP. This agreement sets out the technical, operational and contractual rules and requirements to which parties who wish to avail of the IMP service are required to adhere.
Interoperability Management Platform ("**IMP**")	The platform responsible for receipt of White and Black list files from TSPs and of CEI files from TCs and for generating and issuing the Consolidated list files and CEI files to TCs and TSPs and for creating and issuing settlement statements.
IMP Operator	The operator of the IMP.
KPI	Key Performance Indicator.
LPN	License Plate Number.
National Vehicle and Driver File ("**NVDF**")	The National Vehicle and Driver File is the database of registered vehicles in Ireland.
On-Board Unit ("**OBU**")	This refers to the hardware and software components to be used as part of the toll service which is installed in a vehicle in order to assist in the identification of the vehicle and related TSP or EP account.
PPP	Public Private Partnership.
Settlement Statement ("**SS**")	A statement setting out the sum of all tolls payable by a TSP to a TC during the period of settlement (normally a month).
Toll Collection Agreement ("**TCA**")	This document contains the commercial terms between TCs and TSPs or EPs, including collection fee, responsibilities of respective parties, and arrangements for the administration and settlement of payments between TCs and EPs and required service levels and KPIs.
TII	Transport infrastructure Ireland.
Toll Charger ("**TC**")	The Toll Charger is a public or private entity which levies tolls for the circulation of vehicles in a Toll or EETS Domain.
Toll Context Data	Information provided by the TC on the scope of the charge, and the tariff applicable on the Toll or EETS Domain.
Toll	This is the fee which must be paid by the road user for circulating on a given road, a road network, a structure, such as a bridge or a tunnel, or a ferry

Term or Abbreviation	Definition
Toll Service Provider ("**TSP**")	This is a legal entity providing toll services on one or more EETS Domains for one or more class of vehicle. TSP is used to cover non-EETS Providers already accredited and providing services on Irish toll domains. In this document, the term TSP is used to refer to non-EETS TSPs which have already been accredited and which currently provide toll services on Irish toll domains.
Trust Objects	Security keys associated with the OBU.
White List	List of vehicles and OBUs of valid account holders issued by an EP or TSP to the IMP.

1.2 Interoperable Electronic Tolling Collection in Ireland

1.2.1 Background

In conjunction with delivering a state-of-the art motorway network in Ireland, TII has supported ETC and full national interoperability for all ETC Service Users across that network.

There are currently ten toll roads on the national road network and one on the local road network. Eight of these toll roads have been funded using PPP and the associated tolling facilities are maintained and operated by the PPP concessionaires. Two of the facilities, M50 and Dublin-Tunnel, are operated under contract on behalf of TII. In addition, the East-Link bridge is operated by Dublin City Council ("**DCC**"). All toll facilities incorporate ETC as a means of toll payment.

The toll roads in Ireland are illustrated in the map below in Figure 1:

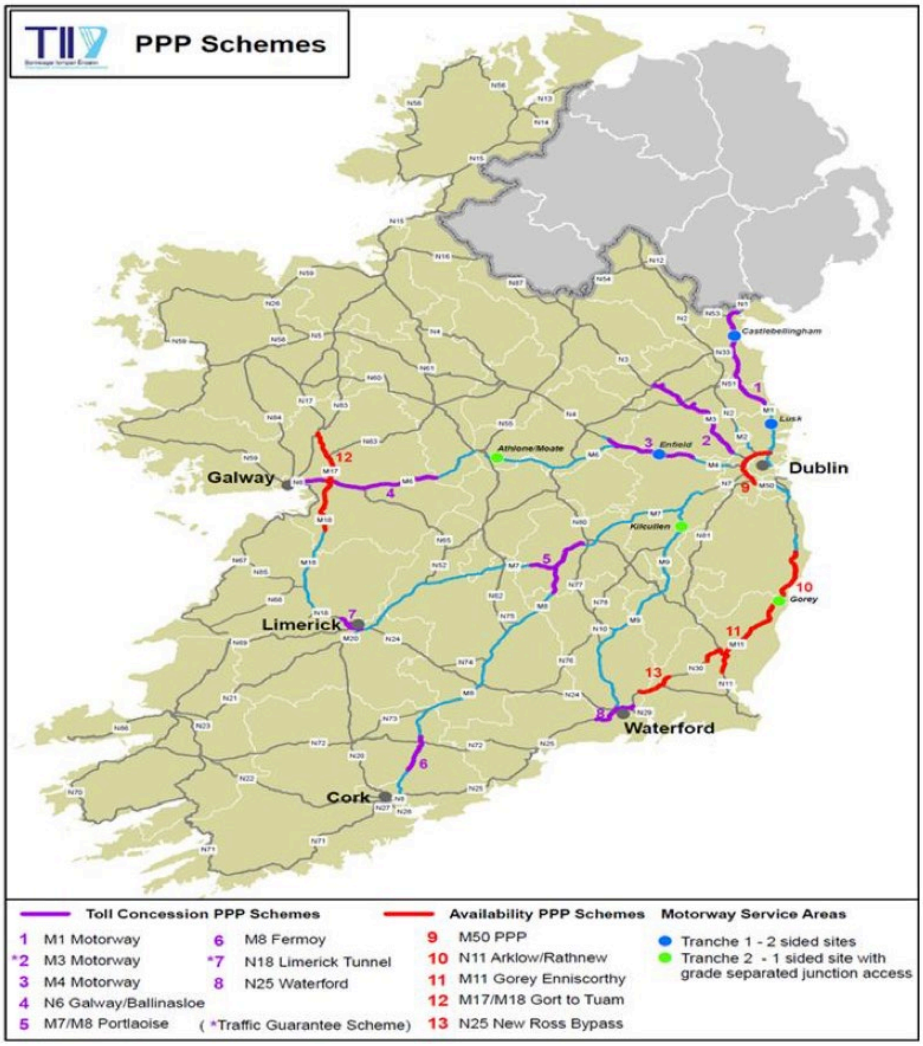

Figure 1: Map of toll roads in Ireland

TII established and continues to manage (as a procuring authority), the IMP as an interoperability hub to facilitate national interoperability. The IMP is operated under contract on behalf of TII by the IMP Operator.

The national interoperability stakeholders comprise:

- **TII:** TII provides the environment management structure through procuring the IMP and developing the contractual framework for tolling interoperability;
- **IMP Operator**: The IMP Operator, providing the IMP on behalf of TII;
- **Toll Chargers**: Entities charged with operating the toll roads and authorised to collect tolls, including the PPP concessionaires, TII and DCC; These entities all accept ETC as a payment method on their facilities. It is to be noted that where the term TC is used in this EETS Domain Statement, this may be taken to mean TII;
- **Toll Service Providers**: The entities that operate and manage ETC Service User accounts, including the issue of OBUs. In Ireland, these consist of PPP concessionaires, TII (via the eFlow brand) and two independent toll service providers. In this document the term TSP is used to cover Non- EETS TSPs already accredited and providing services on Irish EETS Domains.
- **EETS Providers**

1.2.2 Contractual Framework

EETS Providers will be required to sign up to the following agreements in order to provide EETS services on the Dublin Tunnel toll domain:

Accreditation Agreement	This document sets out the obligations of the TC and EP during the accreditation process and is required at the start of the accreditation process.
Interoperability Framework Agreement (IFA)	The IFA sets out the operational and technical requirements to interface with the IMP and the contractual obligations to which Toll Chargers, Toll Service Providers and the IMP Operator must adhere and is required to be in place before commencement of toll services on the toll domain by a TSP or EP.
Toll Collection Agreement (TCA)	The commercial agreement between each Toll Charger and the EETS Provider setting out commercial conditions, obligations and responsibilities, payments and charges. This is required to be in place before commencement of toll services on the toll domain by a TSP or EP.

Table 1 Interoperability Contracts

1.2.3 Technical Interface

The vehicle to roadside interface on Irish toll roads is based on DSRC between a DSRC transponder or OBU mounted in the vehicle and a DSRC beacon positioned at the roadside at the toll plaza. The DSRC communication is through the EN 15509 protocol.

The back office interface with the Toll Charger is carried out via the IMP, which acts as a clearing house for toll transactions between all Irish Toll Chargers and Toll Service Providers. As set out in further detail in the Technical Accreditation Procedure, the interface between EETS providers and the IMP is based around ISO 12855:2022. The terminology used in the IMP is different to that set out in ISO 12855, and the table at section [3.2] in the Technical Accreditation Procedure lists the messages passed between the EETS Provider and the IMP, with the ISO 12855 terminology and the IMP terminology indicated.

It should be noted there are a number of transactions in ISO 12855:2022 that are not used. This includes:

- *'Trust Objects'* – security keys are transferred physically to the IMP. Security keys are generated and transferred at a ceremony held by the IMP Operator. A USB drive with the key generation

master excel program is provided by the current IMP Operator and the procedure will be outlined by them.

- *'Toll Context Data'* – The tariff and hours of operation data is set out in this EETS Domain Statement (see section 2).
- *'User Complaint'* (and 'User Complaint Response') – user complaints are dealt with through the etoll.ie website where complaints can be logged by the EETS Provider, and a response from the associated TC can be viewed.

All Irish Toll Domains operate in a Toll Charger dominant mode, which means that the toll transaction is initiated by the Toll Charger detecting the vehicle on the road.

2. Dublin Tunnel EETS Domain

This section sets out further details in relation to the Dublin Tunnel EETS Domain, including the tolls that EETS Users are required to pay to use the Dublin Tunnel EETS Domain, the applicable legislation and the applicable processes and procedures.

2.1 Location

Tolls are charged for travel by non-exempt vehicles through the Dublin Tunnel in either direction in accordance with the Bye-Laws for the Dublin Port Tunnel made pursuant to the Roads Act 1993 (as amended) (available here) (the "**Dublin Tunnel Bye-Laws**").

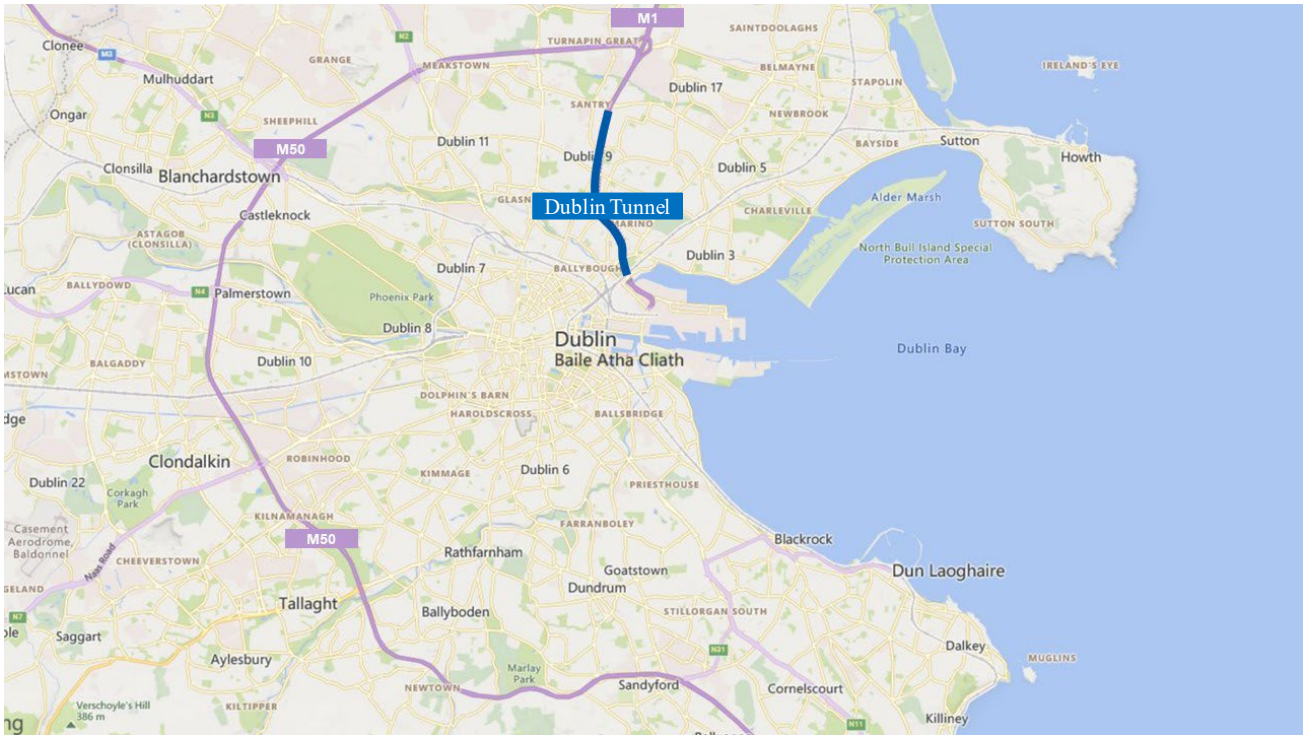

Figure 2: Location of Dublin Tunnel

2.2 Nature of Toll

Table 2 Dublin Tunnel charging scheme.

Criterion	Applicable Requirement
Charging days	All days of the year are tolled.
Charging hours	Toll rates vary according to the direction travelled and the time of day as set out below.
Summary of how the charge is calculated	The toll rates applied are set by TII in accordance with the Dublin Tunnel Bye-Laws. These stipulate the Base Tolls (as defined in the Dublin Tunnel Bye-Laws) which can be adjusted annually taking into account changes in the Consumer Price Index (see further details in section 2.3 below). A list of tolls will be published in a national daily newspaper before the 1st January of the relevant year.

2.3 Standard toll payable

The applicable tolls can be found on the Dublin Tunnel website; https://dublintunnel.ie/toll-information/

A list of tolls are published in a national daily newspaper before 1 January of the relevant year.

2.4 Eligibility and exemptions

All vehicles are subject to toll payment except the categories specified below:

1. Goods vehicles with a maximum gross vehicle weight exceeding 3,500 kilograms.
2. Buses or coaches with seating for more than 25 passengers
3. Ambulances and Fire Brigade Vehicles.
4. Vehicles used by members of An Garda Síochána or the Defence Forces in the performance of their duties as such members.
5. South Dublin City Council's Goods Vehicles used in the performance of the functions and duties of South Dublin City Council.
6. Fingal County Council's Goods Vehicles used in the performance of the functions and duties of by Fingal County Council.
7. Vehicles used by the operator of Dublin Tunnel, or any person appointed to operate and maintain the Dublin Tunnel, in the performance of duties in relation to the Dublin Tunnel.
8. Specially adapted vehicles driven by disabled persons approved under the DTES.

The exemptions are set out in the second schedule the Dublin Tunnel Bye-Laws.

2.5 Toll Transaction Policy

2.5.1 General description of the transaction creation

A transaction is created for each vehicle that passes through the toll point. The following summarises the creation of a transaction:

- The Dublin Tunnel is a tolling system with pre-detection, classification and identification systems in advance of a barriered toll plaza.
- The plaza is equipped with a pre-barrier detection system to reduce congestion at the plaza. The plaza has a gantry in each direction of travel (northbound and southbound), placed in advance of the toll barriers, that is equipped with DSRC readers, ANPR equipment and LIDAR (laser-profiling) equipment to enable the detection, identification, classification and tracking of vehicles.
- A vehicle passing through the toll point is identified through the vehicle's LPN captured by the ANPR cameras, supplemented by the data from the vehicle's OBU, where the vehicle is equipped with one, captured by means of DSRC communication between the OBU and the DSRC beacons mounted on the gantry. There are additional cameras and DSRC readers at the toll barriers.
- Context cameras, axle cameras and LIDAR equipment mounted on the gantry enable vehicle profile, dimensions and characteristics to be determined for the purpose of vehicle classification.

- If a vehicle has been classified as exempt or otherwise identified as exempt (such as through the ETC Consolidated White List or NVDF list), the barrier will raise on approach of the vehicle and the vehicle can proceed through the plaza without stopping providing it is travelling within the design speed range of the system.
- If a vehicle has been matched to the Consolidated White List either through DSRC communication between an OBU and the DSRC reader or through matching of the vehicle LPN with an LPN on the Consolidated White List, the barrier will raise on approach of the vehicle and the vehicle can proceed through the plaza without stopping providing it is travelling within the design speed range of the system. This passage will be added to the CEI file, as described below.
- Where a vehicle has not been identified as exempt or is not on the Consolidated White List or is on the Consolidated Black List, the vehicle will be required to stop on approach to the barrier and either make a card or cash payment at the automatic toll payment machine or to a toll booth attendant.
- The messages between the OBUs and Roadside Equipment (RSE) must be encoded with authentication and access keys provided by the TSP/EP and provided to the IMP who in turn share them the appropriate TCs, in order for the OBU data to be correctly and securely processed. See description of how the key data is obtained under “Trust Objects” in Section 1.2.3.
- Charging and Enforcement Information (CEI) files are generated upon passage of the vehicle through the toll point. The CEI files contain information regarding the vehicle passage required for the charging of a toll. The IMP will consolidate the CEI files from each interoperable TC and will create Consolidated CEI files for each TSP/EP, detailing all the transactions completed by each of its ETC Service Users/EETS Users on the different toll points.
- The IMP will generate settlement statements based on the charging information received, setting out the total amount of toll revenue that the TSP/EP owes the TC for the settlement period. The settlement period is to be agreed between the TC and TSP/EP and is, typically, monthly.
- TCs will issue invoices to the relevant TSP/EP on the basis of the IMP settlement statement less any service charges (toll collection fees) as documented in the TCA between each TC and TSP/EP.
- If an ETC Service User/EETS User believes they have been charged incorrectly, the transaction may be disputed with their TSP/EP, who may, in turn, raise a dispute with the TC. The process for this is set out in the IFA (a copy of which is available to Candidate EPs after the Accreditation Agreement is in place). A dispute may be raised by the TSP through the so-called member’s area of the etoll.ie website. Further evidence (such as photographs of the vehicle) may be used to ensure the ETC Service User/EETS User is correctly charged.

2.5.2 Compliance and Enforcement

The table below indicates the timeline for compliance, and the processes that apply should a road user liable for the toll not make a payment within the required timescale.

Table 3 Procedure when a payment is not made

Criterion	Applicable Requirement
Time limit for compliance	Tolls are paid at the toll plaza by either cashier, automatic machine for coin or card payments or ETC.

Penalty charge or fine levels	Tolls tariffs must be paid at the time of use at the Toll Plaza.
Penalty charge or fine processes	The TC may request payment of the toll after the passage of the vehicle in the event that an ETC Service User/EETS User evades payment or the TC's operator allows passage subject to later payment of the toll.
Channels and payment means for penalty charges or fines	The offender is liable to pay the full value of the toll and may be pursued through the courts.

Note that the steps above apply to an individual ETC Service User/EETS User. Note also that the obligation for payment by an ETC Service User/EETS User who is a registered customer of a TSP or EP where a valid transaction, as set out in Section 2.5.1 above, has been completed, rests with the TSP or EP, as set out in the IFA and TCA.

Vehicles arriving at the plaza with no means of payment and no account may be offered the chance to pay later through the UTT process. This is where the vehicle and driver's details are recorded by the toll booth attendant, and the driver is given a ticket containing details of how to pay the toll retrospectively, and the required timescale. Similarly, if a vehicle has been captured passing through the toll plaza and no payment has been made and the vehicle is neither exempt nor on the Consolidated White List, the TC may retrieve the vehicle owner's details and issue an UTT notice to the vehicle owner requesting payment of the toll.

2.5.3 White Lists and Black Lists

The EP is required to create White Lists and Back Lists to inform the IMP and TCs of the vehicles that are registered with their account holders, and their account status. The mandatory structure, content, schedule and update frequency for both the ETC White and Black Lists according to the Irish national interoperability scheme are detailed in the Technical accreditation procedure.

2.5.4 Toll Declaration

The Dublin Tunnel TC issues the toll declarations for ETC Service User/EETS User passages in batched files called Charging and Enforcement Information (CEI) to the IMP according to the content and schedule detailed in the IFA.

The IMP will extract all transactions specific to each EP and other TSPs from this file and consolidate these transactions with all other relevant transactions from other TCs. The IMP will send the Consolidated Charging and Enforcement Information (CCEI) file to each respective EP and TSP.

The structure of the CCEI files is set out in in the Technical accreditation procedure document.

2.6 The Main Service Provider

There is no main service provider (as defined in the EETS Regulation) for the Dubin Tunnel EETS domain.

2.7 Standards, Service Level Agreements and Dispute Procedures

The procedures and requirements relevant to service levels to be achieved are set out in the documents listed in Table 4 below.

Table 4 Procedures and Service Levels

Criterion	Applicable Requirement
Standards and specifications	These are as set out in the EETS Provider Technical Accreditation Procedure (a copy of which is appended to this EETS Domain Statement) and the IFA (a copy of which can be obtained from TII after the initial application for accreditation is made).
Service Levels	The required service levels and KPIs are set out in the IFA and TCA. See section 3.3.2 below for KPIs. The IFA also sets out various requirements with respect to service levels to be achieved by TCs, TSPs or EPs and the IMP.
Dispute procedure	A dispute resolution procedure relating to interoperability is set out in the IFA. A further dispute procedure is included in the TCA. Under the IFA, all parties are expected to cooperate with each other in good faith. Any technical or operational issues arising shall first be referred to the TC's and EP's or TSP's representatives who shall endeavour to resolve the issue. If such issues fail to be resolved within 20 working days of the issue arising, then disputes will be resolved by an independent expert with reasonable knowledge of the field. If any party in the dispute is dissatisfied with the decision of the Independent Expert, they may commence arbitration in respect of the dispute. The National Transport Authority of Ireland has been appointed pursuant to the EETS Regulations as the EETS National Conciliation Body for Ireland. The National Conciliation Body deals with disputes around access to the EETS Domain, fees and remuneration. Disputes on individual toll transactions are dealt with through the process set out in section 2.5.1 above. Further information on the National Conciliation Body can be found at: https://www.nationaltransport.ie/wp-content/uploads/2011/12/Conciliation_Procedure_in_relation_to_disputes_between_European_Electronic_Toll_Service_Providers__Toll_Chargers_-_March_2014.pdf

3. Commercial and Operational Requirements for EETS Providers

3.1 Governance

a) EETS Providers are required to have at least the following named key personnel during the operational period:

   i. Operations Manager

   ii. Finance Manager

   iii. Customer Services Manager

b) EPs shall provide contact points for day-to-day communications from TII and the IMP on customer queries, payment queries and service queries.

c) During the operational period, EPs shall attend regular review meetings with TII, the IMP and other TCs as agreed in the TCA (i.e. Tolling Interoperability Working Group meeting). These are likely to be at least bi-monthly.

d) EPs shall make it clear to their EETS Users that any questions or comments they may have should be directed to the EP's staff, and they should not attempt to contact the TC or IMP directly.

3.2 Commercial Conditions and Payments

This section sets out the commercial conditions between the EETS Provider and the TC.

Before the EP starts providing toll services on the TC's EETS Domain, the CEP must have:

- agreed and signed the Deed of Adherence to the IFA;
- executed a Toll Collection Agreement (TCA) with the TC, setting out the main commercial terms, including the toll collection fee.

3.2.1 Charges and Payments

The following table sets out the payments and charges relating to an EP offering services on the Dublin Tunnel EETS Domain. The intended level of these fees will be set out in the Accreditation Agreement and enshrined in the IFA and TCA to be entered into between the EP and TII.

It should be noted that if the CEP intends to provide services to more than one EETS Domain in Ireland, the IMP integration fee and IMP fixed fee will only need to be paid for the first Irish EETS Domain the CEP is accredited on.

Table 5 Summary of payments required of EPs

Payment	From	To	When due	Where set out
Accreditation Fee	EP	TII as TC	After signature of accreditation Agreement, and before accreditation testing commences	This is set out and agreed in the Accreditation Agreement
Accreditation re-test fee	EP	TII as TC	Before the re-test of any tests failed during the accreditation	This is set out and agreed in the Accreditation Agreement
IMP Fees - Integration Payment	EP	[TII as IMP procuring authority]	On signature of Deed of Adherence to IFA and subsequently when achieving transaction volume milestones during the Contract Period	Schedule 7 of IFA
IMP Fees – Fixed Operational Payment	EP	[TII as IMP procuring authority]	Monthly during operations	Schedule 7 of IFA
IMP Fees – Variable Operational Payment	EP	[TII as IMP procuring authority]	Monthly during operations	Schedule 7
Toll collection fees	EP	TII as Toll Charger	Monthly during operations against invoice from TC	Tolls due for EP's user's vehicles as set out in the Calendar Settlement Statement (CSS) less the EP's agreed collection fee as indicated in the Accreditation Agreement and agreed in the TCA.
Re-accreditation fees	EP	TII as IMP procuring authority	If, during normal operations, the EP notifies TII of changes that require some re-	Re-accreditation fees will be dealt with in accordance with the IFA

Payment	From	To	When due	Where set out
			accreditation tests, the re-accreditation fees shall be payable before the tests begin.	and/or the change control procedure under the TCA.

3.2.2 Toll payments

As noted above, the EP is obliged to pay the TC the toll (less the EP's agreed collection fee), for a valid EETS transaction (the vehicle must be on the ETC White List and not on the ETC Black List of the EP) relating to one of its EETS Users, irrespective of the EP's ability to recover the toll from the EETS User. The EP is responsible for indicating the correct tariff class for vehicles on their ETC White List.

Payments shall be made by electronic funds transfer to an account specified by the TC. Further details are set out in the TCA.

3.3 Technical Requirement to be met by EPs

3.3.1 Interface requirements

Interface requirements for the two interface points between TC and EP are set out in the EETS Provider Technical Accreditation Procedure (see Appendix A.1).

3.3.2 Performance and KPIs

3.3.2.1 KPIs overview and process.

The EP is responsible for ensuring that any issues that may affect ETC charging are addressed as soon as reasonably possible.

Performance requirements may be set out in the IFA and TCA.

4. Accreditation Process for a new EETS Provider

Figure 3 below describes the process required for a new EP (a "**Candidate EETS Provider**" or "**CEP**") to provide services on the Dublin Tunnel EETS Domain. Some steps may be undertaken concurrently but the CEP is required to ensure that its OBUs are acceptable to the Dublin Tunnel Toll Charger. The CEP may wish to also have their OBUs tested on the other Irish toll domains to ensure that they can also offer their services on those toll domains in future. This can be facilitated by the IMP but arrangements will have to be made with the individual Toll Chargers in accordance with the relevant accreditation procedure. The process also requires the testing and validation of the back-office interface between the CEP and the IMP and the full end to end process.

The process of gaining accreditation on the Dublin Tunnel for a Candidate EETS Provider (CEP) is summarised in the diagram below. Each of the processes is described in more detail in the following sections.

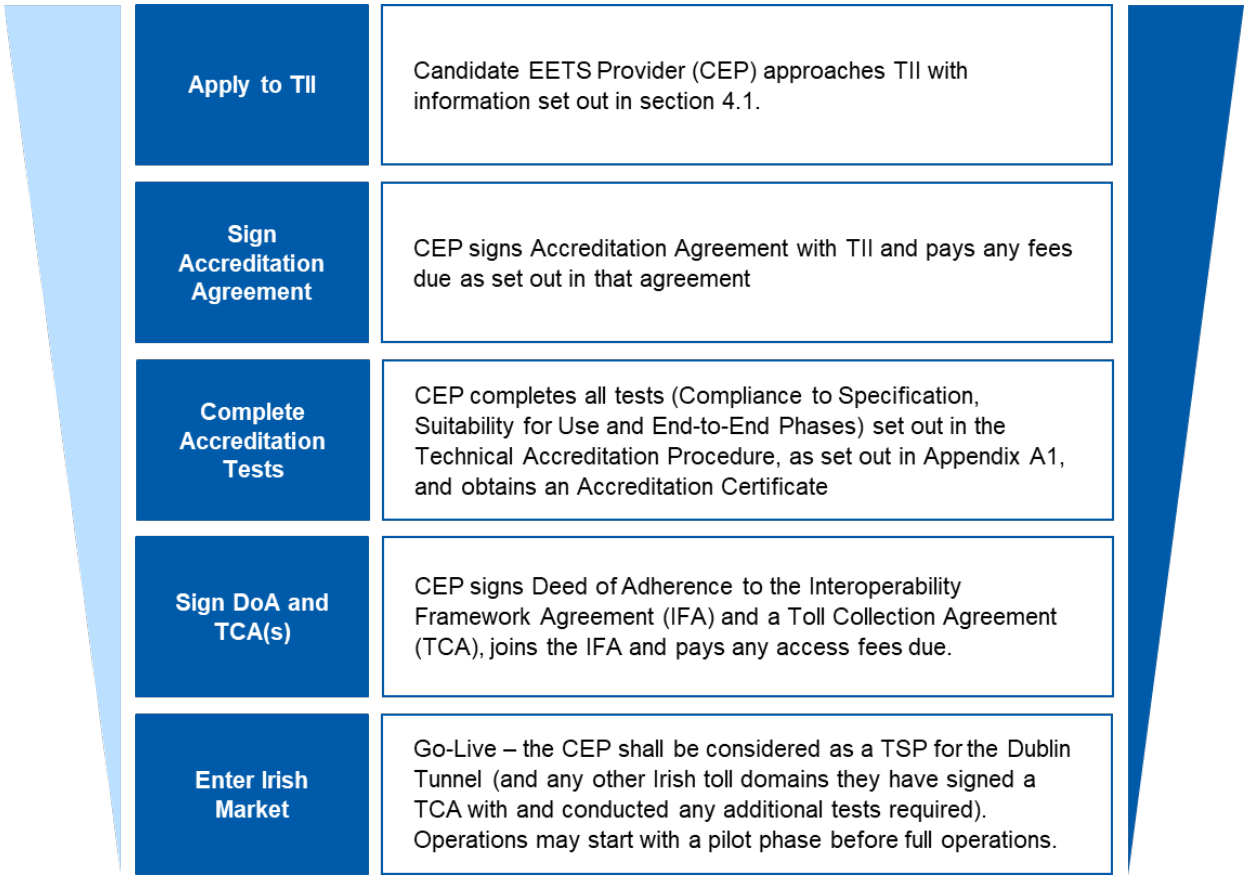

Figure 3: Process for Candidate EETS Provider

4.1 Application to be Accredited

A CEP wishing to enable their account holders to use their accounts to pay the toll on the Dublin Tunnel should contact TII at the address set out in section 1 above. The CEP may request an informal discussion with TII in the first instance, and if they decide to go ahead, they should make a formal application to TII providing the following information:

1. A Statement that the CEP wishes to become an EP for the Dublin Tunnel EETS Domain, and understands the obligations set out in Article 5(1) of the EETS Directive 2019/520 regarding other EETS Domains in Ireland;
2. Details of the CEP (including its full legal name, registered company number, registered company address, trading or business name, telephone number and email address);
3. Details of their CEP's EETS Provider registration and country of registration (if applicable);

4. Details of the CEP's representative (including name, address, telephone number and email address);
5. Details of the number of years the CEP has carried on business under its current name;
6. Details of the CEP's corporate status;
7. The CEP shall provide a statement, in form and substance satisfactory to TII, confirming that it:
   a) is not insolvent, bankrupt or being wound up, it has not entered into administration, examinership or another equivalent or similar process, it has not entered into an arrangement with creditors, it has not been suspended from business activities or is not in any analogous situation arising from a similar procedure under applicable national laws and regulations;
   b) has not been convicted of any criminal offence concerning its professional conduct;
   c) has fulfilled its obligations relating to the payment of social security contributions in accordance with the law of the country in which it is established; and
   d) has fulfilled its obligations relating to the payment of taxes in accordance with the law of the country in which it is established.
8. A detailed description of the technical equipment to be provided by the CEP for the purpose of facilitating ETC in accordance with the IFA;
9. A statement outlining the CEP's proposed contracting policy towards EETS Users, incorporating proposed key terms and conditions of contract; and
10. A global risk management plan outlining the evaluation and mitigation measures of the risks relevant to its provision of ETC.

4.2 Accreditation Agreement

Once the application set out above is received by TII, and if it has been evaluated by as complete, the CEP and TII shall enter into an Accreditation Agreement. The Accreditation Agreement sets out the obligations on TII and the CEP during the accreditation process, the accreditation fees and the categories of fees which will apply during operations.

4.3 Technical Accreditation Tests and Certification

Once the Accreditation Agreement has been signed by both parties, and all necessary fees have been paid the accreditation tests shall be carried out. The required accreditation tests are set out in the EETS Provider Technical Accreditation Procedure document (see Appendix A.1).

Once all these tests have been completed to the satisfaction of TII, TII will issue an Accreditation Certificate to the CEP. It should be noted that this certificate is only valid for the software versions and hardware tested, and that changes may need a degree of re-testing in line with the change process set out in the TCA.

4.4 Contractual Arrangements

Once the CEP has obtained the Accreditation Certificate, in order to allow their account holders to use their accounts on the Dublin Tunnel toll road, the contracts and commercial agreements must be finalised as set out below.

4.4.1 Deed of Adherence to the IFA

All interoperable tolls for Irish EETS Domains are processed through the IMP. In order to use this service, the CEP must sign a Deed of Adherence to the Interoperability Framework Agreement (IFA). A copy of the IFA, including the Deed of Adherence, is available from TII following receipt of a formal application from the CEP for accreditation.

If the CEP has been accredited on any other EETS Domain in Ireland, they may have already signed a Deed of Adherence to the IFA.

4.4.2 Toll Collection Agreement

The CEP must also agree a Toll Collection Agreement (TCA) with the Toll Charger for the Dublin Tunnel – TII. There is a model TCA in the IFA which will be amended to include specific commercial terms which will apply to the EP.

4.5 Commencement of Services

Once the CEP has the Accreditation Certificate and has signed the Deed of Adherence to the IFA, and the TCA has been executed by both parties, the CEP shall agree a date for commencement of services for the Dublin Tunnel with TII. Services shall start with a pilot phase where the service starts with a limited number of account holders, and, only when the required service performance has been demonstrated, is the service extended to all the CEP's EETS Users. Details of the pilot phase are set out in the EETS Provider Technical Accreditation Procedure (see Appendix A.1).

5. Accreditation for other EETS Domains within Ireland

Each EETS Domain in Ireland has a toll charger, and an EETS Domain Statement outlining the particular requirements for that domain. However, all current TCs for EETS Domains in Ireland process interoperable payments through the IMP.

For an EETS Provider already accredited on the Dublin Tunnel, it is likely that, from a technical viewpoint, accreditation on other Irish EETS Domains is considerably simplified, as the EP's transactions with the IMP are essentially the same as for the Dublin Tunnel. Nonetheless, there is likely to be a degree of testing required for a new EETS Domain, especially of the OBU.

The Deed of Adherence to the IFA will cover technical interoperability with all Irish TCs. It will, of course, be necessary for the EP to negotiate a new Toll Collection Agreement (TCA) with every TC that they wish to provide services to.

The EETS Directive requires EETS Providers to provide services to all EETS Domains in a country within 24 months of providing services to one domain, and TII strongly encourages all EETS Providers accredited on the Dublin Tunnel to also gain accreditation to provide services to all EETS Domains in Ireland.

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A.1 Appendix 1 – EETS Provider Technical Accreditation Procedure

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Appendix A.1

EETS Provider Technical Accreditation Procedure

Date: 20 March 2025

Bonneagar Iompair Éireann
Transport Infrastructure Ireland

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1. Purpose

The purpose of this document is to specify the technical procedures for EETS Providers (EPs) seeking to enable their customers to pay for tolled transactions relevant to the use of Irish toll roads through their account.

TII is the Toll Charger for each of the Dublin Tunnel and M50 toll schemes and therefore manages the accreditation process for these two toll schemes.

It should be noted that, as set out in Section 3.2, all the back-office transactions for all toll schemes in Ireland are passed through the interoperability management platform (IMP), which has been procured by TII in its capacity as a procuring authority and acts as a hub for toll transactions for all Toll Chargers and Toll Service Providers in Ireland. This accreditation procedure takes account of the IMP back office interface and its technical and operational requirements, and can therefore be used as a model for other EETS domains in Ireland, if the relevant Toll Charger so wishes.

This document should be read in conjunction with the EETS Domain Statement for the relevant EETS Domain. Capitalised terms used in this document shall have the meaning given to such terms in the applicable EETS Domain Statement.

References to 'Toll Charger' or 'TC' in this document refer to TII.

2. Scope

This document covers the technical part of the technical accreditation process for the M50 and Dublin Tunnel toll schemes. The purpose of the technical accreditation process is to ensure that EETS Providers comply with the technical and operational requirements of the M50 and Dublin Tunnel schemes and comply with the EETS Directive and the EETS Regulations.

This EETS technical accreditation process outlines the specification conformance and testing procedures for the following elements:

1. The Roadside interface between the EETS Provider's equipment (OBU) and the Toll Charger's roadside equipment ("**RSE**") beacons using DSRC transactions that are in accordance with EN 15509.
2. Back-office interface from the EETS Provider to the Toll Charger via the IMP.

This technical accreditation procedure forms the basis of the acceptance of an EETS provider to provide services on their domain. Once passed, the Candidate EETS Provider ("**CEP**") is then issued with an Accreditation Certificate for their On-Board Unit and their back-office interface to the Toll Charger via the IMP.

3. Technical Requirements

This section sets out the technical requirements of the interfaces between the CEP's system and the TC's systems. There are two interfaces between the CEP and the TC:

- CEP's on-board unit (OBU) to the TC's DSRC beacon; and
- CEP's back office to TC's back office (in practice this is an interface to the IMP).

3.1 OBU Interface Requirements

The OBU shall be a 5.8 GHz Microwave DSRC On Board Unit that can be read and processed by the TC's RSE and shall comply with the EN 15509 profile.

See Appendix A for further technical details of the interface requirements.

3.2 Back Office Interface Requirements

As noted previously, all back office transactions between the EP and the TC is conducted through the IMP, which acts as a hub and clearing house for all toll transactions between EP and TCs. This is illustrated in Figure 1 below.

Figure 1 Interoperability through the IMP

The interface between the EETS Provider and the IMP is based on ISO 12855:2022. The terminology used in the IMP is different to that set out in ISO 12855, and the table below lists the messages passed between the EETS Provider and the IMP, with the ISO 12855 terminology and the IMP terminology indicated.

Table 1 IMP file terminology

IMP name	ISO 12855:2022 name	Transmitting party	Receiving party	Specification
Charging and Enforcement Information (CEI)	Toll Declaration	TC	IMP Operator	Only the consolidated data sent to the EP.
Consolidated Charging and Enforcement Information (CCEI)	Billing Details	IMP Operator	EETS Provider	See Appendix A
Whitelist*	Exception list - Whitelist	EETS Provider	IMP Operator	See Appendix A
Blacklist*	Exception List - Blacklist	EETS Provider	IMP Operator	See Appendix A
Settlement Statement (SS)	Payment Claim	IMP Operator	EETS Provider	See Appendix A
Calendar Settlement Statement (CSS)	Payment Claim	IMP Operator	EETS Provider	See Appendix A

* The terms "Consolidated ETC White List" and "Consolidated ETC Black List" are also used in this document, and these are simply the Whitelists and Blacklists of all EPs on the IMP consolidated by the IMP into one list.

It should be noted there are a number of transactions in ISO 12855:2022 that are not used. These include:

- 'Trust Objects' – security keys are transferred physically to the IMP. Security keys are generated and transferred at a ceremony held by the IMP Operator. A USB drive with the key generation master excel program is provided by the IMP Operator and the procedure will be outlined by them.
- 'Toll Context Data' – the tariff and hours of operation data is set out in the relevant toll domain statement. Any changes will be communicated through the contractual change process.
- 'User Complaint' (and 'User Complaint Response') – user complaints are dealt with through the etoll.ie website where complaints can be logged by the EETS Provider, and a response from the associated TC can be viewed.

All Irish toll domains operate in a Toll Charger dominant mode, which means that the toll transaction (CEI file) is created by the Toll Charger detecting the vehicle on the road.

See Appendix A for further technical details of the back-office interface requirements and the message formats.

4. The Technical Accreditation Process

This section describes the CEP assessment process and methodology.

4.1 Overview of the Technical Accreditation Process

Once the Accreditation Agreement has been signed by both parties, the technical accreditation process can begin. At the start of the technical accreditation process:

a) There shall be a start-up meeting between the TC and the CEP, and a subsequent schedule of meetings shall be agreed.

b) The TC shall make available all required technical documents to the CEP, including the functional design of the IMP.

c) The parties shall agree arrangements for the provision by the CEP of test OBUs and decryption keys.

d) The TC shall set out arrangements for the CEP to access the IMP test environment.

e) The parties shall agree details of any pilot phase, including target number of users and transactions.

f) The TC shall set out the documentation required from the CEP and the required submission dates.

The CEP shall submit a draft test plan to the TC for review and approval. The test plan shall encompass the complete testing process, including conformance to specification (noting that no physical testing may be required if suitable evidence of previous testing is provided), suitability for use and end to end tests and shall include, but shall not be limited to:

1. The overall test strategy
2. The proposed test schedule / timetable
3. The test phases, and the reviews / tests to be carried out in each phase
4. A description of each test case indicating entry criteria, the process, the expected results and criteria for success (exit criteria)

5. Management of test failures and issues
6. Test environments and facilities to be provided by the CEP
7. CEP's requirements from the TC and the TC's contractors (facilities, staff, reviews etc.)
8. Test reporting
9. CEP's management staff and contact points
10. A health and safety plan including risk assessments
11. A proposed schedule of meetings with the TC during the accreditation period
12. An overview of where components of the CEP's solution have been tested in a similar tolling application. Further details should be provided in the conformance to specification phase.

The CEP shall not proceed to the conformance to specification tests until the test plan has been accepted by the TC.

Following acceptance of the test plan, the technical testing can commence, and once successfully completed, an Accreditation Certificate will be granted by the TC to the CEP.

Following award of the Accreditation Certificate, the execution of a Deed of Adherence to the IFA and the execution of a TCA between the CEP and the TC, the pilot phase may commence.

Once the pilot phase has been successfully completed, the CEP may commence toll services on the EETS Domain.

The overall process is set out in Figure 2, below and the parts covered by this technical accreditation procedure document are shown in blue. The greyed-out sections are covered by the relevant EETS Domain Statement.

During the accreditation process, the CEP and TC shall meet at the beginning and end of each test phase or at such other intervals as may be agreed between the parties. The CEP shall provide the proposed agenda and any background documents in advance of the meetings, and shall circulate a record of decisions and actions to all attendees within a week of the meeting which shall be subject to review and approval by the TC. The CEP shall also provide monthly process reports to the TC, setting out its progress towards completion of each of the phases, the forecast completion dates of each of the phases and shall include any significant risks and issues that have arisen and proposed measures to address these.

Figure 2 Accreditation process overview – sections covered by this document shown in blue.

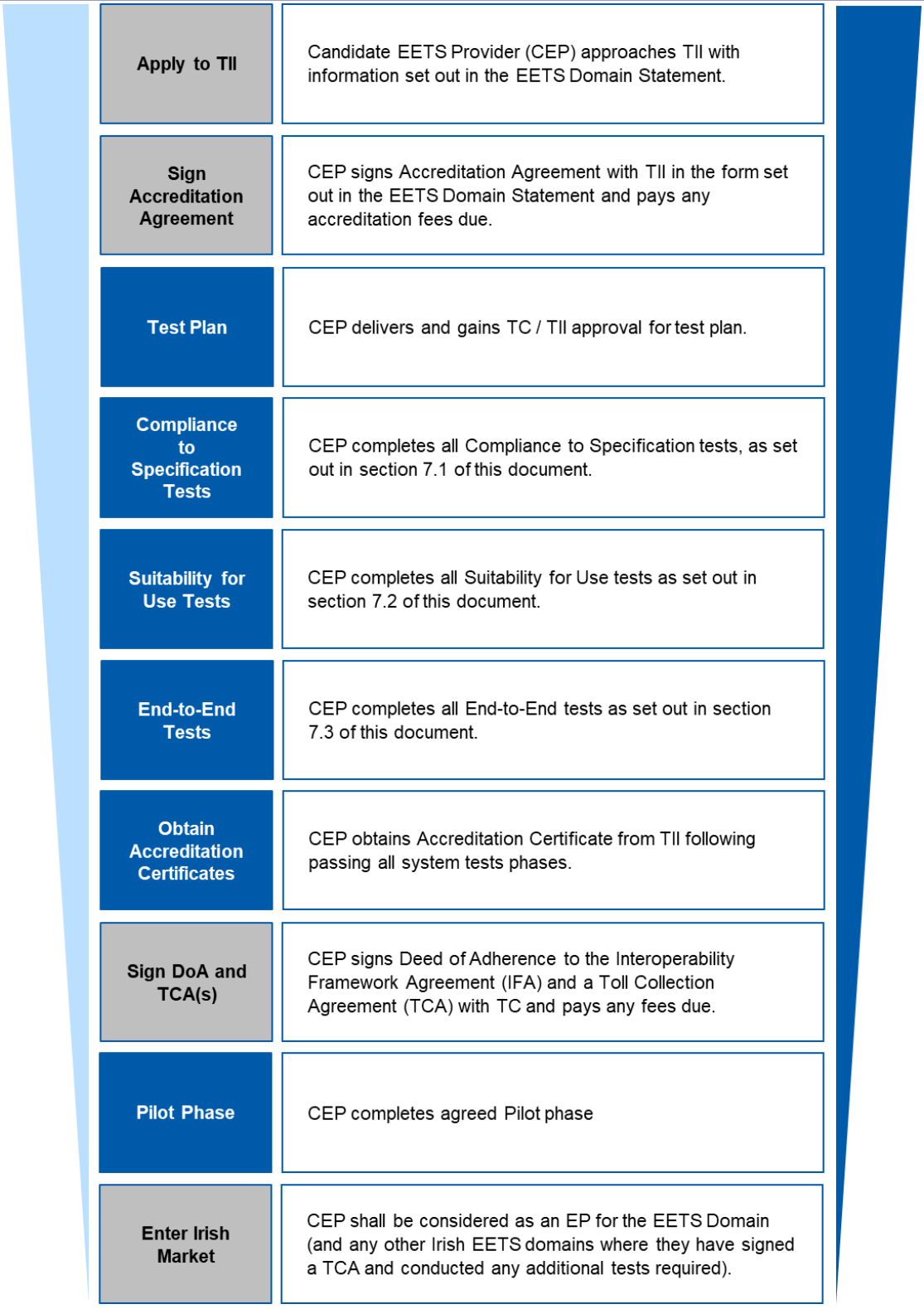

Figure 3: Accreditation Process Overview

5. Accreditation Tests

Following acceptance by the TC of the Test Plan, as set out in section 4.1 above, the technical accreditation tests set out below can commence in accordance with the following four main phases:

a) Conformance to Specification

The purpose of this phase is to ensure that the CEP's proposed systems and implementation conform to the required specifications and processes and are suitable to progress to phase 2 – the suitability for use tests.

b) Suitability for use tests

The purpose of these tests is to validate that the CEP's interoperability constituents, including its OBU and back office interface, perform in accordance with the required performance requirements, including technical and operational requirements. These tests will validate that the CEP can send and receive the required files to and from the IMP in accordance with the requirements and can perform the DSRC transaction in accordance with the TC's technical requirements.

c) End to end tests

The purpose of the end to end tests is to validate that all relevant files originating from the TC and processed through the IMP are received and processed correctly by the CEP and that all relevant files originating from the CEP and processed through the IMP are received and processed correctly by the TC.

d) Pilot Operation

The purpose of the pilot operation, the requirement for which may, at the TC's discretion, be waived, is to validate that the CEP meets all the technical and operational requirements over a period of time. The pilot operation is undertaken following the conclusion of the suitability for use tests, the issuing of an Accreditation Certificate, the execution of the Deed of Adherence to the IFA and the execution of a TCA with the TC, and is performed with a limited number of the CEP's account holders.

It should be noted that the successful certification is only valid for the Toll Charger's tested OBU with the tested hardware, firmware and software version and the back-office interface version used for the testing. Any changes shall require a re-certification process. This process is set out in Section 6 below.

The following sections describe each of the test phases in further detail.

5.1 Conformance to Specification Tests

The conformance to specification tests are a review of documentation provided by the CEP to confirm adherence to the required standards and specifications, and relevant prior testing carried out. This has two parts, covering the two interfacing items, the OBU and the back-office interface. This shall be in conformance with the Commission Implementing Regulation 2020/204 Annex III.

The documentation provided by the CEP will be reviewed and assessed by the TC and, if additional information is required, this shall be requested. When the information provided is assessed as compliant with the above requirements, it shall be approved.

This phase must be completed to the satisfaction of the TC before commencement of the suitability for use tests. It may not be necessary for the CEP to carry out testing explicitly for the EETS Domain as part of the conformance to specification phase, but they may rely instead on tests conducted previously, subject to the provision of the appropriate documentation as outlined below.

5.1.1 OBU Conformance to Specification tests

The CEP shall deliver to the TC the following documentation:

a) Documentation providing evidence of CE marking of the OBU, in compliance with the EU requirements for CE marking, including, the technical dossier and the EU declaration of conformity.

b) Test reports with content and test results that are consistent with the criteria set out in CSN EN 15876-1: Electronic fee collection - Evaluation of on-board and roadside equipment for conformity to EN 15509 - Part 1: Test suite structure and test purposes.

c) The relevant OBU manufacturer examination certificates in accordance with Decision No 768/2008/EC.

d) Details of any additional testing carried out.

5.1.2 Back-Office Interface Conformance to Specification Tests

The CEP shall deliver to the TC documentation showing that the proposed back-office interface between the IMP and the EETS Provider is compliant with the back-office interface specification set out in Appendix A.1.3.

These conformance checks only cover the interface between the CEP and the IMP and do not cover the transactions between the Toll Charger and the IMP, although the latter will be included in the end-to-end test phase.

If the CEP wishes any test results from similar toll systems to be considered as a part of the accreditation process, they shall submit all the associated test reports, interface specifications and references to applicable standards.

5.2 Suitability for Use Tests

5.2.1 Overview – Suitability for use tests

The suitability for use tests are to demonstrate to the TC's satisfaction that the technical interfaces between the CEP's systems and the IMP and TC's systems are working as required. This shall be in conformance with Annex III of Commission Implementing Regulation 2020/204. The suitability for use tests shall not be started until the conformance to specification tests have been completed to the satisfaction of the TC.

Each test carried out shall be documented in a test report, which shall be reviewed by the TC. The test reports shall contain the following as a minimum:

1. Title and description of the test
2. Date(s) of the test(s)
3. Entry criteria, exit criteria and expected results
4. Equipment used, and hardware / software versions
5. Test process carried out (including a note of any tests that could not be carried out or could not be completed, and the reasons for this)
6. Test results
7. Analysis of any test failures, including a proposed severity, and proposed rectification and re-test plan
8. Conclusions

The test reports are subject to review and acceptance by the TC.

5.2.2 OBU Suitability for Use Tests

5.2.2.1 OBU Suitability for Use Tests Overview

These functional tests focus on the compatibility of the OBU DSRC interface to the TC's RSE. It is anticipated that there may be instances where particular OBU models brought forward by the CEP possess identical hardware and software attributes to those already in use in Ireland. Should this be the case, it may allow exemption from some tests, however, this shall be at the sole discretion of the TC. All OBU suitability for use tests shall be carried out as on-road tests. There will be no simulation carried out in a laboratory or at a test site.

There are three different toll plaza types in operation in Ireland:

1. The M50 is a full multi-lane free-flow (barrier free) toll system.
2. The Dublin Tunnel is a barrier tolling system with vehicle detection in advance of the toll barriers to enable vehicles with valid ETC accounts or exempt vehicles to pass through the plaza without stopping providing they are travelling within the deign speed of the system.
3. Other EETS Domains in Ireland have conventional barrier tolling.

The types of required tests for each of these types are set out in table 2 below, although it should be noted that the required tests for EETS Domains other than the M50 and Dublin Tunnel are at the discretion of the relevant TC for that domain.

At the start of testing, the CEP shall deliver sufficient test OBUs to the IMP, and provide the test decryption keys. This would normally be five OBUs for every TC. The provision of suitable test vehicles and drivers shall be agreed between the CEP and TC during the accreditation process.

5.2.2.2 OBU Suitability for Use Test (SUT) Objectives

The key objectives of the OBU SUTs are:

a) To confirm and validate OBU DSRC transactions across the interface with roadside equipment (DSRC beacons).

b) Ensure the reliability of the OBU DSRC transaction under different conditions and situations of vehicles, position and traffic.

The following table sets out the required SUTs:

5.2.2.3 OBU Suitability for use tests

Number	Name	Description	Test elements
OBU1	Free-Flow Tolling (M50 only) Basic operation	Testing CEP OBU functionality in interaction with the user and the roadside equipment under dynamic on-road conditions. The purpose of this test is to ensure that the OBU operates normally with the roadside equipment and performs valid transactions whilst in a designated lane on the road.	1. OBU securely installed on test vehicle. 2. Vehicle passes toll gantry 3. Observe OBU signal of valid DSRC transaction (One [1] beep) 4. For each passage of any station type with each of the OBUs under test, observe that a valid DSRC transaction is performed. 5. Test to be performed a minimum of 5 times.

Number	Name	Description	Test elements
OBU2	Free-Flow Tolling (M50 only): Lateral position/In-between Lane test	The purpose of this test is to ensure that the OBU operates normally with the roadside equipment and performs valid transactions whilst straddling two lanes.	1. OBU securely installed on test vehicle. 2. Vehicle drives in between lanes and passes toll gantry 3. Observe the OBU signal of valid DSRC transaction (One [1] beep) 4. For each passage of any station type with each of the OBUs under test, observe that a valid DSRC transaction is performed. 5. Test to be performed a minimum of 5 times.
OBU3	Free-Flow Tolling M50 only): Mounting position and vehicle type	The purpose of this test is to ensure that the OBU operates normally with the roadside equipment when mounted at various angles (45 degrees -light vehicle; 90 degrees -heavy goods vehicle). It is to be assumed that the optimal position for OBU at the top centre of the windscreen (behind the rear-view mirror) The OBU is to be installed there.	1. OBU securely installed on test vehicle(s), i.e. motor vehicle and truck. 2. Vehicles pass toll gantries. 3. Observe OBU signal of valid DSRC transaction (One [1] beep). 4. For each passage with each of the OBUs under test, observe that a valid DSRC transaction is performed. 5. Test to be performed a minimum of 5 times.
OBU4	Free-Flow Tolling (M50 only): Vehicle Speed	Testing CEP OBU functionality in interaction with the user and the roadside equipment under dynamic conditions. The purpose of this test is to ensure that the OBU operates normally with the roadside equipment and performs valid transactions whilst the vehicle is travelling at different operational speeds.	1. Sample OBU securely installed on test vehicle(s), i.e., motor vehicle and truck. 2. Vehicles pass toll gantry. Toll passages are to be performed with the OBU at 40 km/h, 80 km/h and 100 km/hr. 3. Observe OBU signal of valid DSRC-transaction (One [1] beep) 4. For each passage with each of the OBUs under test, observe that a valid DSRC transaction is performed and signalled appropriately by the OBU. 5. At least five (5) passes at each speed will be required to verify functionality. 6. Note this test may be combined with test OBU1
OBU5	Barrier Toll lane Passage (for all barrier toll systems except Dublin Tunnel)	Testing CEP OBU functionality in interaction with the toll plaza equipment under normal conditions. The test for OBU functionality in interaction with traditional toll plaza technology. The main aim of this test is to ensure that the OBU communicates correctly with the beacon of the currently used toll	OBU securely installed on test vehicle(s), i.e. motor vehicle and truck. Test vehicle is assigned a specific lane. Driver approaches the toll plaza and approaches the barrier. If valid OBU account – barrier raises and vehicle proceeds, and OBU signals correct transaction (One [1] beep).

Number	Name	Description	Test elements
		lane and performs valid transactions.	If OBU is Blacklisted, barrier stays down and OBU signals Blacklisting (if used). At least 5 passes with each OBU status shall be required to verify functionality.
OBU6	Tests for Dublin Tunnel only – including advance vehicle detection	Testing CEP OBU DSRC functionality in the interface with the Low Speed Free-Flow DSRC beacons in the Dublin Tunnel hybrid low speed free-flow system. The test also tests for correct OBU functionality across the interface with the additional DSRC beacons at the barrier.	OBU securely installed on test vehicle(s), i.e., motor vehicle and truck. Test vehicle is assigned a specific lane. Driver approaches the low speed free-flow gantry at the recommended speed (30 kph). If valid OBU account – barrier raises and vehicle proceeds, and OBU signals correct transaction (One [1] beep). If OBU is Blacklisted, barrier stays down and OBU signals Blacklisting (if used). Ensure OBU has also transacted with the DSRC beacon at the barrier. At least 5 passes with each OBU status shall be required to verify functionality, tests to use different lanes.
OBU7	Tests for all barrier tolling systems including Dublin Tunnel Mounting position and vehicle type	The purpose of this test is to ensure that the OBU operates normally with the roadside equipment when mounted at various angles (45 degrees -light vehicle; 90 degrees -heavy goods vehicle). It is to be assumed that the optimal position for OBU at the top centre of the windscreen (behind the rear-view mirror) The OBU is to be installed there.	1. OBU securely installed on test vehicle(s), i.e., motor vehicle and truck. 2. Vehicles pass toll gantries. 3. Observe OBU signal of valid DSRC transaction (One [1] beep). 4. For each passage with each of the OBUs under test, observe that a valid DSRC transaction is performed. 5. Test to be performed a minimum of 5 times.

Table 2: OBU suitability for use tests

5.2.3 Back Office Suitability for Use Tests

5.2.3.1 Back Office Suitability for Use Tests overview

This section covers the suitability for use tests that must be carried out between the CEP and the IMP's back-office systems in order to gain accreditation. This section does not cover the internal system and integration testing that the CEP should have carried out on their own system in advance of any application for accreditation.

5.2.3.2 Back Office Suitability for Use Test Objectives

The objectives of the back-office suitability for use tests are:

a) Test the connectivity of the CEP's back office to the IMP.

b) Ensure all the transaction messages between the CEP and the IMP are transmitted and received correctly.

c) Ensure that incorrect or error conditions are processed correctly.

5.2.3.3 Back Office Suitability for Use Tests

All functional back-office tests will be carried out using a test environment simulating the operation of the IMP, which will be provided by the IMP. Details of how to access this IMP test environment will be provided to the CEP upon signature of the Accreditation Agreement with the TC.

The following back-office functions shall be tested:

Number	Name	Description	Test elements
BO1	Transfer full White List (EETS terminology – Exception List – Whitelist)	Transferring a full White List from the CEP's back office to the IMP.	CEP Uploads a correctly formatted White List. CEP Receives an acknowledgement of correctly formatted White List. Ensure White List is correctly imported into IMP's Consolidated White List (CWL). Repeat the above tests with error conditions (to be proposed by the CEP in their test plan) to ensure rejection notices are correctly received and processed.
BO2	Transfer full Black List (EETS terminology – Exception List – Blacklist)	Transferring a full Black List from the CEP's back office to the IMP.	Same as test BO1, but for full Black List.
BO3	Download Consolidated Charging and Enforcement Information (CCEI) file (EETS terminology – Billing Details)	CEP receives CCEI file from the IMP.	IMP sends correctly formatted CCEI files to the CEP. CEP receives CCEI file and acknowledges correct receipt. CEP ensures CCEI is correctly processed in their system. Repeat the above tests with error conditions (to be proposed by the CEP in their test plan) to ensure rejection notices are correctly received and processed.
BO4	Download Settlement Statement (SS) (EETS Terminology – Payment Claim)	CEP receives SS file from the IMP.	CEP receives SS file and acknowledges correct receipt. CEP ensures SS is correctly processed in their system. Repeat the above tests with error conditions (to be proposed by the CEP in their test plan) to ensure rejection notices are correctly received and processed.
BO5	Download Calendar Settlement Statement (CSS)	CEP receives CSS file from the IMP.	Same as test BO4 but with CSS.

Number	Name	Description	Test elements
	(EETS terminology – Payment Claim)		

Table 3: Back office suitability for use tests

5.3 End To End Tests

5.3.1 End to end test objectives and overview

The objectives of the end-to-end tests are:

1. Ensure toll transactions are correctly processed through the entire system from TC through the IMP to the CEP and in the reverse direction.
2. Ensure the billing / settlement system works correctly from CEP to TC.
3. Ensure incorrect transactions are identified by the systems.
4. Ensure the user complaints system operates correctly.

5.3.2 End-to-end test cases

The end-to-end testing should cover the following as a minimum:

Number	Name	Description	Test elements
E2E1	Vehicles to CCEI (Billing Details)	Detection of multiple vehicles over a time period to ensure that the CCEI is received correctly and contains the correct passage details.	Whitelisted vehicle Blacklisted vehicle. ANPR to OBU discrepancy
E2E2	CCEI to Settlement	Ensure that the CCEI leads to the correct settlement statement and calendar settlement statement received at the CEP's back office.	Settlement Statement Calendar Settlement Statement

Table 4: end to end tests

5.4 Issuing of Accreditation Certificate

Once all of the testing set out in the sections above has been successfully passed, and all test reports have been submitted to and approved by the TC, with no unresolved critical, major or moderate test issues, the CEP may apply for an Accreditation Certificate from the TC. This indicates that, from a technical perspective, the CEP's systems are compatible with the TC's systems.

5.5 Pilot Operation Phase

5.5.1 Pilot objectives and overview

The pilot operations test phase shall only commence after all of the conformance to specification, suitability for use and end-to-end tests have been successfully passed and an Accreditation Certificate has been issued by the TC.

In addition, all the required commercial agreements shall have been put in place, including the Deed of Adherence to the IFA, and a TCA between the TC and the EP.

The pilot operation test phase is where the EP identifies a number of Service Users (SUs) who are willing to take part in the pilot operation tests, and who will use the tolled roads. The number of SUs taking part in the pilot operation shall be agreed between the CEP and the TC. These SUs are set up as account holders in the CEP's system and are issued with OBUs.

The SUs then use the toll schemes during an agreed period, using as many of the facilities, and in as many different ways as possible.

The objectives of the pilot operation phase are:

1. To identify any residual system issues, before opening the systems to all the CEP's customers.
2. To identify any operational issues before opening the systems to all the CEP's customers.

The full range of interoperable ETC processes i.e. list generation, CEI files, settlement statements, must be in operation throughout duration of the pilot operation phase, and these are to be recorded for performance evaluation.

Please note that transactions during the Pilot Phase shall be real transactions, and not test transactions.

During the accreditation start-up phase, the TC and the CEP shall agree on the number of transactions and the defined period of operation that will be deemed sufficient to satisfy the objectives of the pilot operations phase. It is recognised that different CEPs may differ in their ability to recruit service users to participate in the phase, and the target volume of users shall be agreed between the TC and CEP in the start-up phase of the accreditation.

A pilot operation phase has benefit for both the CEP and the TC. However, in exceptional circumstances, if a pilot operation phase is not practical, the TC may agree to forgo the phase and allow full operation following issue of the Accreditation Certificate, and signing of the commercial agreements.

5.5.2 Pilot Phase Organisation

The CEP shall identify, nominate and present the SUs they propose to take part in the pilot operation test phase. This shall be subject to the approval of the TC.

The CEP shall provide the TC with the operational decryption keys for the OBUs. These shall be transferred on physical media at a keys ceremony.

The CEP, the TC and the IMP shall monitor the transactions and check for correct operations.

5.5.3 Pilot result evaluation

All issues shall be noted in an issue register and given a priority rating agreed between the CEP and the TC. All issues shall be addressed, the order dictated by the priority rating.

5.5.4 End of Pilot Operation

The pilot operations test phase shall end when an agreed volume of transactions and/ or time of operation has been completed, all high priority issues discovered during the pilot operation have been resolved to the satisfaction of the TC, and a rectification plan has been agreed for any residual low priority issues. This would normally be the final test phase and would complete the technical part of the initial accreditation process.

The CEP will then be authorised to provide their services to all their Service Users for the EETS Domain(s) included in the accreditation process.

6. Re-certification Process

Once an EETS Provider has been certified and has moved into the operation phase, it is necessary to have a process which applies to any changes to the EP's systems. This could be any of the following changes:

1. Changes to the EP's OBU; or
2. Changes to the EP's back-office system that may affect the interface to the IMP.

The overall change process will be as set out in the TCA. No changes shall be implemented by the EP without prior notification to and the agreement of the TC. It is therefore necessary for the EP to give the TC sufficient notice of any intended changes to their interfacing elements, including, but not limited to, full technical details of the proposed change and a suggested re-testing scope and programme, details of which shall be set out in a test plan by the EP. This is subject to review and approval by the TC. The degree of re-testing required shall depend on the scope and the possible effects of the proposed change.

6.1 Re-certification of the OBU

Changes to the OBU that shall require re-certification include but shall not be limited to:

a) A software or firmware update to the EP's existing model of OBU

b) Introducing a new model of OBU that has previously been used by another service provider with one or more of the Irish Toll Chargers (TC)

c) Introducing a new model of OBU that has not previously been used by another Irish TC but has been tested in accordance with the technical standards and carries CE marking

d) As per b) above, but has been tested by a Notified Body

e) A new OBU that does not have full evidence of testing

f) Changes to encryption / decryption keys

6.2 Re-certification of the back-office interface

Only changes to the EP's back office that have the potential to affect the interface to the IMP or could affect any process that impacts the IMP or one or more TCs shall be subject to a re-certification process. This shall include but not be limited to:

a) Changes of hosting

b) Software updates to the interfacing code

c) Changes to third party software

d) Changes to security processes (other than patching or minor updates)

Appendix A - Interface Specifications

A.1.1 Introduction

This section sets out the technical and operational requirements for the interfaces between the TC and the EP in further detail. There are two main interfaces:

- Roadside – EP's On-Board Unit (OBU) and the TC's DSRC beacon.
- Back office – the EP's back office to the TC's back office. In practice, this is actually all carried out through the IMP, and so this is an interface between the EP's back office and the IMP.

The technical requirements for these two interfaces are set out in this section below as well as in the IMP Solution Functional Design, which will be made available to the CEP on application for accreditation.

A.1.2 OBU to roadside DSRC interface

The OBU shall be a 5.8 GHz Microwave DSRC On Board Unit that can be read and processed by the TC's Roadside Equipment and shall comply with the EN 15509:2014 or EN 15509:2023 profile. Other legacy OBU profile standards may be accommodated at the TC's discretion. Note at the time of writing there are no GNSS-based toll schemes in Ireland, and so only the simple 'OBU' transaction to the above standards is required for all Irish toll domains, even if the OBU is a GNSS type. This may change in the future.

The EP's White List and Black List shall always associate the OBU with the vehicle's registration mark as displayed on the vehicle's number plate. OBU 'swapping' between vehicles is not permitted unless reflected in the associated White List or Black List.

OBUs and RSE must be encoded with authentication and access keys provided by the CEP in order for the OBU to be processed. There will be test keys for the suitability for use tests, and operational keys for the pilot and operational phases. Keys are exchanged on physical media at a key ceremony with the IMP.

The OBU must be so positioned as to be read by the beacons located over the lane. If the OBU does not respond or partially transmits transponder data, the Service User will normally be charged using ANPR data captured and matched against the IMP's Consolidated ETC White List. The associated transaction that is subsequently sent to the EP for settlement purposes will be clearly flagged as being a 'degraded mode' transaction.

The OBUs provided for test shall be capable of being easily attached to the relevant test vehicles and may be detached without risk of injury to persons or damage to the relevant vehicle.

The following table indicates the data fields in the EN 15509 standard and indicates which are mandatory and which are optional for OBUs in Ireland. While certain fields are indicated as optional, these are not used in practice; further guidance may be sought prior to testing. The process relies primarily on matching of the OBU ID to the Consolidated ETC White List and Consolidated ETC Black List from which attributes such as Licence Plate Number and Vehicle Class can be derived rather than such attributes being available from and communicated by the OBU. Note also that Receipt Data is not programmed into the OBU but is written to the OBU by the roadside beacon as a record of the completed transaction.

Attributes (EID>0)	AttrID	Type	Length in Bytes	TII use*	Remarks
CONTRACT					
EFC Context Mark	0	32	6	M	Contract provider's identification
PAYMENT					

Attributes (EID>0)	AttrID	Type	Length in Bytes	TII use*	Remarks
Payment means (including PAN)	32	64	14	M	Personal account Number, PAN expiry date and payment means and payment means usage control
VEHICLE					
VehicleLicensePlateNumber	16	47	Variable 13 to 17 bytes	O	
VehicleClass	17	49	1	O	
VehicleDimensions	18	50	3	O	
VehicleAxles	19	51	2	O	
VehicleWeightLimits	20	52	6	O	
VehicleSpecificCharateristics	22	54	4	O	
EQUIPMENT					
EquipmmentOBUId	24	56	5(=1+4)	M	
EquipmentStatus	26	58	2	O	
RECEIPT					
ReceiptData1 (last)	33	65	28	M	
ReceiptData2 (penultimate)	34	66	28	M	

Table 5: EN 155509 data fields

* M=mandatory O= optional N= not used

A.1.3 Back Office Interface

The interface between the back office of the EETS Provider and the Toll Charger is through the IMP.

The IMP allows, on a technical level, an EETS Provider to provide services to any Irish Toll Charger (TC), and hence, the back-office interface is between the EETS Provider and the IMP. The transactions with the toll chargers are all through the IMP, which acts as a 'clearing house' for all of the toll transactions.

Figure 4: information exchange through IMP

A.1.3.1 XSD files

Full details of the structure of the interface messages are set out in the following .xsd files available from the TC:

11_EETS_CEI.xsd

12_EETS_Settlement.xsd

13_EETS_Lists.xsd

A.1.3.2 Whitelists and blacklist files

The EP is required to provide both ETC White and Black Lists of its Service User base; these lists have to be complete as opposed to partial, meaning that they have to list each Service User that has an account with them, including all related information, especially the OBU data.

The mandatory content, schedule and update frequency for both the ETC White and Black Lists according to the Irish national interoperability scheme are detailed in the following table.

List		Content		Update	
Type	OBU Name	Full Name	Comment	Field Type	Frequency
White	cm obu vc vm	Context Mark OBU Vehicle Class Vehicle Registration Number	Unique issuer identifier Unique OBU identifier Universal class Vehicle licence plate	nvarchar(25) nvarchar(25) integer nvarchar(100)	Twice Daily at 10:00 and 16:00 (Dublin Time)
Black	cm obu rs	Context Mark OBU Reason	Unique issuer identifier Unique OBU identifier Reason code for Blacklisting	nvarchar(25) nvarchar(25) nvarchar(256)	Hourly

Table 6: ETC List transfer schedule

Service Users that are the EP's account holders will only be permitted to carry out an ETC transaction if they are on the EP's Whitelist and not on the EP's Blacklist.

Classification will be determined using the process set out in the appropriate toll domain statement (TDS) for the toll domain. It is the responsibility of the EP to ensure that the classification data for both the Licence Plate Number and associated OBU is correct and verified.

Upon receipt of a new list, classification is deemed as permanent until expiry of that list. There is no process in place to acknowledge a temporary change in classification details.

A.1.3.3 CEI (Billing Details) files

The mandatory content, schedule and update frequency for the CEI files according to the Irish national interoperability scheme are detailed in the following table:

List	Content				Update
Type	OBU Name	Full Name	Comment	Field Type	Frequency
CEI	sp	Service Provider	Detected OBU issuer identifier	Integer	Every 3 hours from 6:30 AM to 9:30 PM: 6:30 AM 9:30 AM 12:30 PM 3:30 PM 6:30 PM 9:30 PM
	cm	Context Mark	Unique TC identifier	nvarchar(25)	
	obu type	OBU Type	Detected OBU identifier.	nvarchar(256)	
	date	Date	Defaulted to ETC Date and time of the Passage (format YYYYMMDDhhmmss)	datetime	
	vc	Vehicle class	Universal class	integer	
	loc	Locality	Unique identifier of plaza/lane	integer	
	bid	Beacon Identifier	Unique beacon identifier	integer	
	avi	AVI	Toll charge including VAT	float	
	ave	AVE	Toll charge excluding VAT	Float	
	res	Resolution	Code identifier for type of transaction processing	nvarchar(10)	
	num	Num	Unique identifier of the passage in TC system	integer	
	enf	Enforcement	Passage enforcement status	nvarchar(50)	
	vrn	Vehicle Registration Number	Read vehicle licence plate	nvarchar(100)	

Table 7: CEI file details

A.1.3.4 Settlement Statement

The IMP issues a separate Settlement Statement to the EP from each TC, setting out the amounts owed by the EP to the TC.

The format of the Settlement Statement and Calander Settlement Statement is as set out in the .xsd files above.

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