

Road Charging in Europe

Overview and Lessons Learned

25.2.2021

Objectives

- Concept of Interoperability
- Comparing Actors in the Tolling
- Provisioning of Services
- Application of Key Processes in Tolling / Road Pricing
- Using Technology in Tolling / Road Pricing
- Summary

Concept of Interoperability

Main purpose

The purpose of the European Electronic Toll Service (EETS) is to simplify the transport within the European Union. After successful registration and certification of EETS provider, the EETS will enable the toll payment in all toll domains of the European Union:

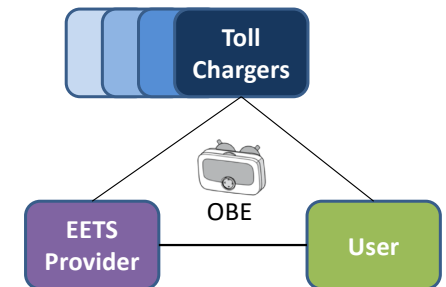
- **through a single contract with**
- **a single EETS provider and**
- **a single On-Board Equipment (OBE).**

Registration and Certification of EETS provider

- Registration process evaluates provider from its financial, technical and operational capabilities
- Certification is focused on
 - fulfilment of **EETS legislation**,
 - Technical **verification of back-office system** functionality
 - **Verification of technical parameters and functional reliability** of planned OBE (each OBE type has to be validated)

Standardization

- Necessary to design toll collection and enforcement systems in accordance with known standardization
- This approach will help to avoid build up of hybrid systems with proprietary interfaces like it is currently in some of EU countries



Comparing Actors in the Tolling



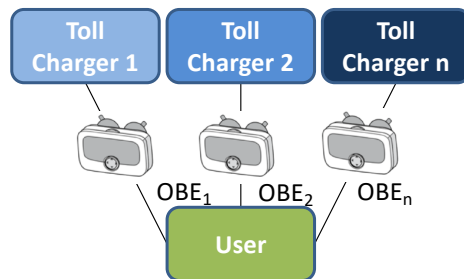
Non- Interoperable Tolling Systems

User perspective

- Using of **individual OBE** in each state causing discomfort for drivers due to the placement of a large number of different OBEs on the windscreen
- Higher costs related to the OBE
- System designed for post-paid and pre-paid users

State perspective

- An independent toll collection process in each country
- Strengthening the position of the state in the role of toll collection including ownership of the data



n OBU = n Contracts



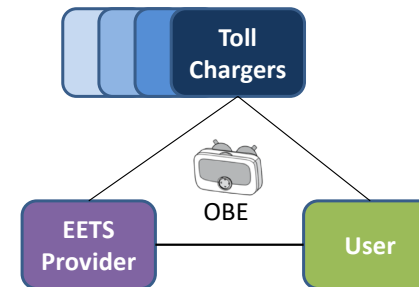
European Interoperability

User perspective

- Use of OBE for toll collection across all selected EU countries and more services
- Reduction of costs related to the OBE

State perspective

- Toll chargers are focused more on service providers instead of end users
- Cost reduction on customer services and OBE
- Increase costs on remuneration for EETS providers with economic return for the state



1 OBU = 1 Contract



Provisioning of Services



Non- Interoperable Tolling Systems

Goal of services of national tolling system

- National tolling/road pricing systems have been designed for the purpose of toll collection only
- Processes are designed to easily hand in/hand out OBE, pay for the toll or download necessary documents
- Most of the time all services are being provided in a name of road authority without possibility to offer different/extended services
- There is no primary intention to provide more services even using the same data/devices



European Interoperability

Goal of the EETS

- EETS services liberalize the tolling market with increase competition as well as quality of service
- Extend portfolio of the EETS providers by various:
 - Telematic services
 - Financial services
 - Insurance services
 - Parking services
 - Loyalty services
 - Telco services
- All types of these services can be provided using the same OBE together

Application of Key Processes in Tolling / Road Pricing



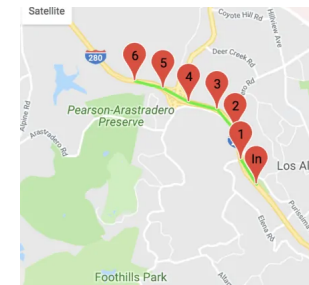
Registration using EETS

- **User** is registered in the system of EETS provider only
- EETS provider is obliged to register only **vehicle** parameters into each national tolling system
- Vehicle registration is being processed in an automated way using **pre-defined interfaces** (white list and black lists with details of vehicles only - **no customer details are provided**) in each state
- Customer personal details are being provided only in case of identification of enforcement incident



Toll Declaration

- What is it? In case of using GNSS system which doesn't need road side constructions for toll collection, OBE records the positioning data and sends them via GSM at regular intervals to the system for further processing
- It is up to each state **whether algorithm to identify specific road segment will be done by toll charger or service provider**
- **Quality and efficiency of toll collection is directly dependent on reliability of used OBE**
- In case of using DSRC or ANPR technology, transactions are identified directly by system when vehicle is passing bellow the toll collection gantry



Application of Key Processes in Tolling / Road Pricing



Charging

- Charging procedure covering calculation from the declared road segments in accordance with relevant toll rate for specific vehicle category is equal either it is being done by locally or by EETS provider



Remuneration

- Provisioning of EETS is not for free. According to changes in EETS directives, providers have the right for non-discriminative remuneration
- Remuneration has to cover the costs related to toll collection
- Service model is based on reselling services from toll chargers to all customers



Customer care

- The main focus of EETS providers is to register and provide services for **post paid users**
- It is still expected that there will be at least one “**National service provider**” providing services for pre-paid users including **network of Points of sales**. There is an example of Czech tolling system which has more than **40% of vehicles registered in pre-paid regime** (toll is deducted based on real spending from credit online)

Application of Key Processes in Tolling / Road Pricing

Toll Enforcement

- Enforcement detects misuse, incorrect use and other violations of the tolling regulations
- Enforcement is in full responsibility of each toll charger and not EETS provider
- Efficiency of electronic toll collection system is strongly dependent on the rules for penalties and effectiveness of enforcement system as such

Violation processing

- In case of **domestic enforcement**, toll charger systems are directly connected to necessary registries to identify violator
- Time to process such toll offence is highly dependent on workload of specific administrative personnel
- **Cross-border enforcement** systems are eligible to request the customer data from EETS providers to ensure that all unpaid toll and penalties will be processed
- New legislation is trying to help to solve cross border enforcement using the same mechanism as exchange of information on road-safety-related traffic offenses – **currently it is still in the position as “plan”**

Using Technology in Tolling / Road Pricing

Technology

Definition of three main technologies for electronic road toll systems using an On Board Equipment technologies (Satellite positioning, Mobile communications, 5,8GHz microwave technology) or extended ANPR technology for video-tolling had significant impact on decisions of the road authorities in various countries (see tab. bellow).

- There is a trend for preferred GNSS technology to be used for the purpose of toll collection of HGV as shown by table bellow
- ANPR Video-tolling is preferred technology for toll collection of light vehicles especially for concessions

	ANPR		GNSS		DSRC	
	Less than 3,5t	more than 3,5t	Less than 3,5t	more than 3,5t	Less than 3,5t	more than 3,5t
2013				Hungary		
2014				Belgium		
2015						
2016						
2017						
2018						Slovenia
2019				Czech Republic		
2020	Poland			Bulgaria		
2021				Poland		
2022				Lithuania		
2023						Croatia
2024				Netherlands		

Tab. 1 Overview of preferred technology for electronic toll collection system

Summary

- **Liberalization of tolling market** has been done by introduction of EETS. Thanks to EETS, EETS providers are able to offer more services using the same OBE. This step **increased competition and decreased the costs** for toll chargers as well as users
- **Legislation and directives in EU have direct influence into technology decisions** as well as necessity to standardize interfaces with the main aim **to achieve interoperable European Union**
 - It allows to build up national toll collection system independently in each state
 - Be able to flexibly integrate new interoperable system
- Efficient toll collection will work in **combination of mentioned core processes with care of:**
 - Verification of **reliability of OBE** components for toll collection
 - And design an **efficient enforcement system** with appropriate rules for violations
- **Preferable technology** for the purpose of toll collection is **GNSS technology** (as shown in Tab.1)

Thank You!

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