BASELINE ASSESSMENT AND FINANCIAL IMPLICATION TO E-TOLLING INTEROPERABILITY – STATE OF PLAY

Transport Community - 7th Road Technical Committee

10 March 2022

Agenda

1. Introduction on 4icom
2. E-tolling Project: Objectives and Planning
3. Interoperability : What is at stake
4. Discussion

1. Introduction on 4icom

4icom – Our Team

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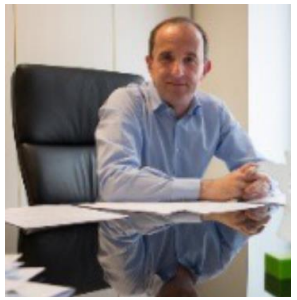
Senior Partner / Founder of 4icom



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European tolling expert
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Junior Consultant at 4icom (France)

2. E-Tolling Project: Objectives and Planning

Organization of the Study – Overall Programme

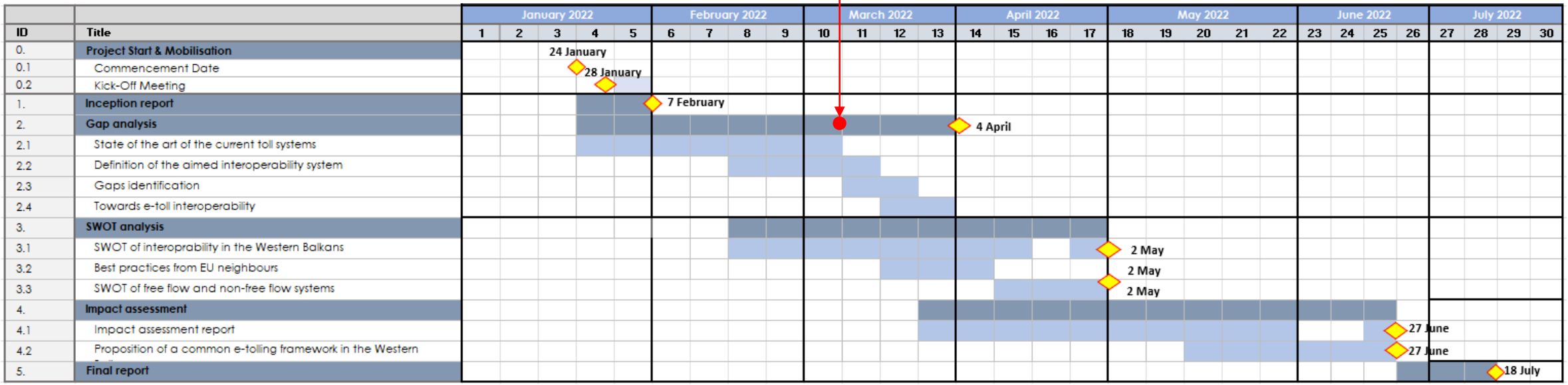
The study is divided into three main tasks, whose outcome will be produced by means of five different deliverables (in addition of the Inception report and the Final report):

- **Task 1: Gap Analysis**
  - Assessment of the current system – GAP Analysis
- **Task 2: SWOT Analysis and Best Practices**
  - SWOT analysis of **interoperability** in Western Balkans
  - Best practices on e-tolling interoperability from neighbouring to the region EU countries & SWOT analysis of **Free Flow** and non-Free Flow systems
- **Task 3: Impact Assessment**
  - Impact assessment
  - Report on a common e-tolling framework in the Western Balkans (description for the short-term and long-term changes)

=> Our first and main tool for achieving all three tasks : the interview process

Project Schedule

7th Road Technical Committee



The Data Collection & Interview Process

The interview process is our first and main tool to collect and consolidate the information upon which carrying out the gap analysis, the SWOT analysis and the impact assessment

- **Meetings took place or will take place with all 6 Regional Partners**
  - The interview grid is sent in advance to allow the gathering of data
  - The meeting is used to go into details about the tolling system
  - Follow-up on specific elements where necessary
- **We are basically looking for the following information:**
  - **Current toll network and its "planned" evolution over the next 5-10 years**
  - **Legal framework and relational model** (applying laws and rules, key stakeholders and their roles, contractual relation, level of adoption of EU directives, etc., for both tolling and enforcement)
  - **Actual and forecasted traffic levels** (possibly with differentiation between light and heavy vehicles and between national and international vehicles)
  - **E-tolling services available and penetration among the users** (possibly with differentiation between light and heavy vehicles and between national and international vehicles)
  - **Pricing mechanisms and levels**
  - **Technologies and existing/planned e-tolling schemes**
  - **Lifecycle costs for existing e-tolling schemes**

3. Interoperability : What is at stake

3.1 Definition and Legal Framework

The EU Directive 2019/520 and other regulations provide for the technical, operational and contractual conditions to be met to achieve interoperability and in particular to establish the European Electronic Tolling Service (EETS)

- Achieving **interoperability** means establishing and implementing of a **set of mechanisms** (technological, operational and contractual) allowing **road users to pay tolls on any involved tolling facilities across the Western Balkans Partners (and in general across Europe)**, using a single account and a single on-board unit (OBU), set-up and distributed by one of the recognized toll service providers;

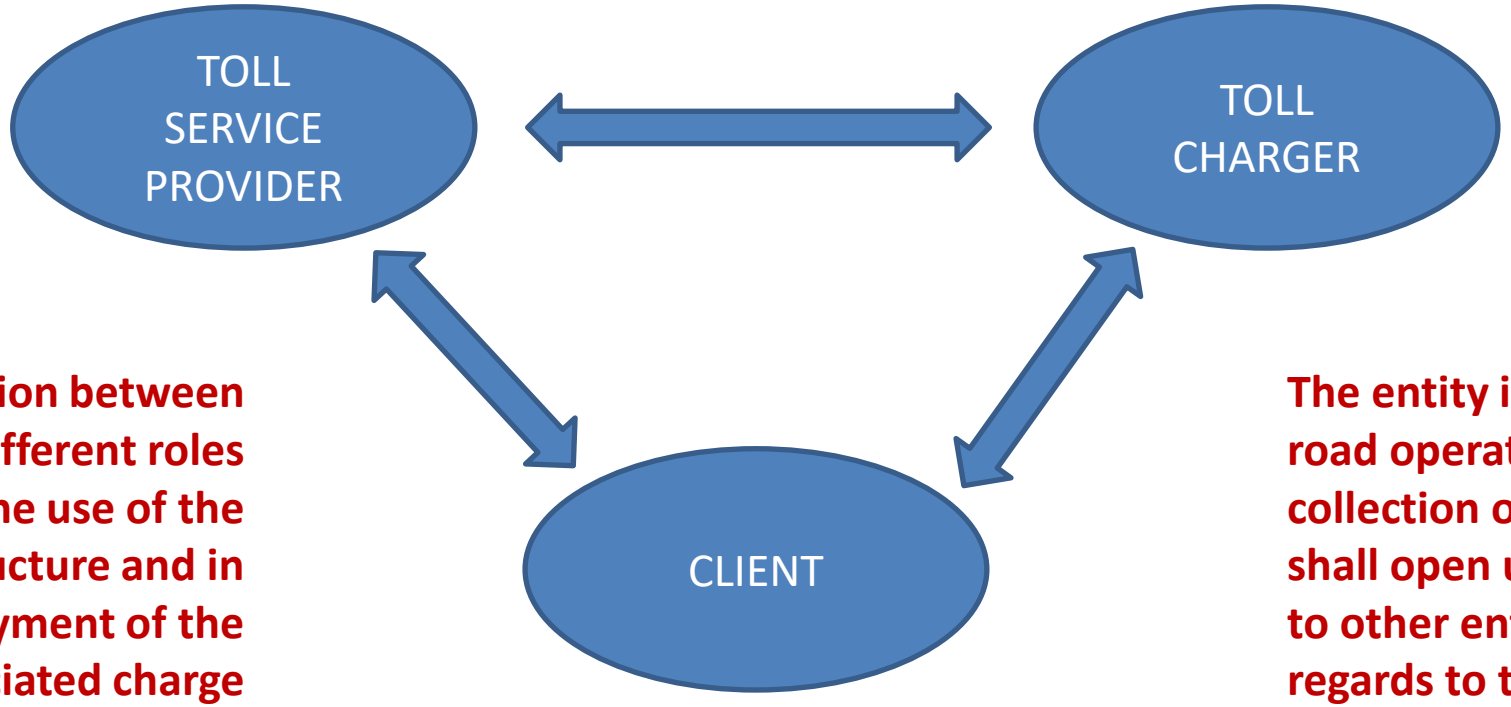
- It goes beyond adopting technically interoperable technologies, as all involved stakeholders must agree upon a set of :
  - technical specifications ensuring compatibility between the systems;
  - business and operational rules along which the e-tolling service shall be provided;
  - contractual terms ruling the relations among the different players involved in the service;
  - actual legal framework in place.
- **A common European business model** has been defined by the EU Directive 2019/520/EU; It specifies a clear separation between the role of the Toll Charger (i.e. the operator of the road and the entity in charge of collecting a toll for the use of the road) and the Toll Service Provider (i.e. the entity offering to the road user toll payment services either at national or international level);

- Interoperable services do not mean to completely replace any e-tolling services that are being offered within each country, the interoperable e-tolling service is additionally proposed to meet demand from interested users;

3.2 The Operational Model

The aim of the study and of our work is not to copy paste the EU recommendations to the Western Balkans RPs networks, but rather to define a framework facilitating e-tolling interoperability between the 6 Regional Partners

Providing a payment service to its clients



Managing the road infrastructure and/or charging a toll/tax for its use

Clear separation between the three different roles involved in the use of the road infrastructure and in the payment of the associated charge

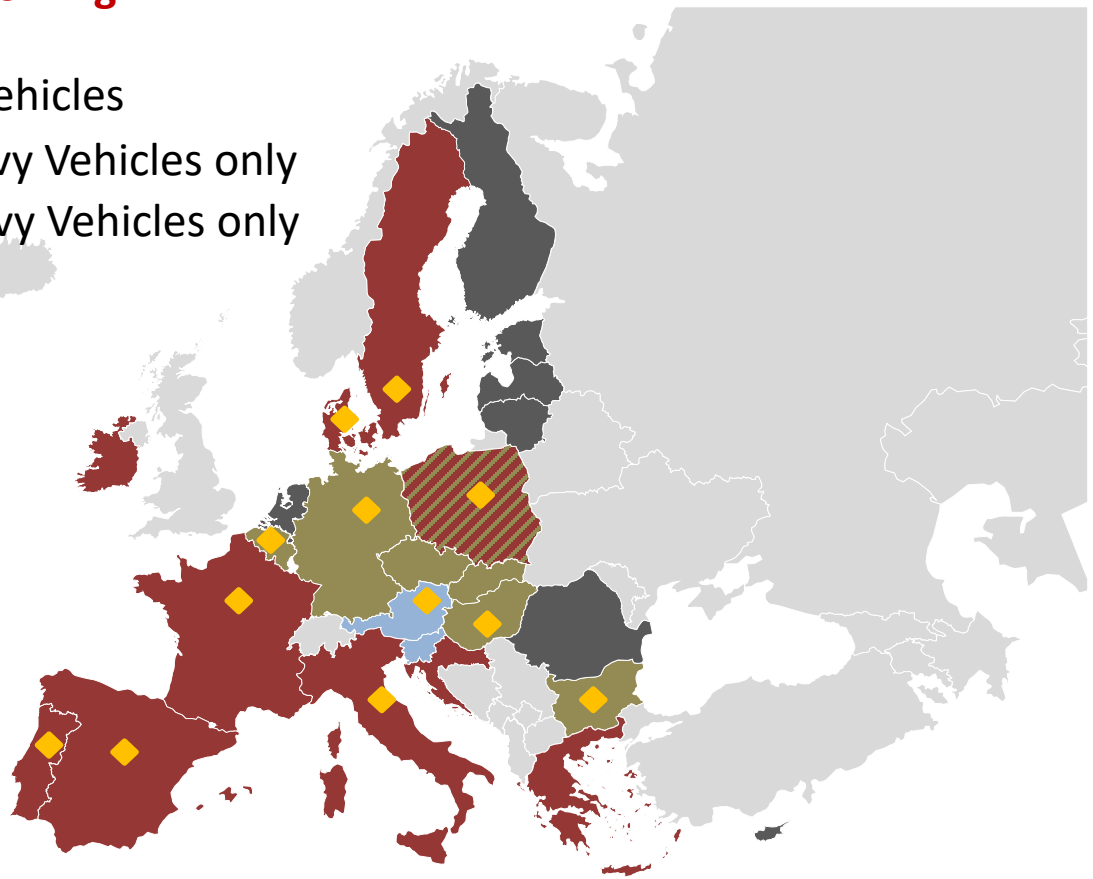
Travelling through the road infrastructures and using the service provided to pay for the toll/tax

The entity in charge of the road operation and of the collection of the charge shall open up their market to other entities, with regards to those users who may be interested by a trans-national interoperable e-tolling service

3.3 Implementation Status in the European Union

Implementation of e-tolling (interoperable or not) services across Europe is not completely homogeneous but the market for interoperable service is continuously growing

- Countries with DSRC-based e-tolling services for all vehicles
- Countries with DSRC-based e-tolling services for Heavy Vehicles only
- Countries with GNSS-based e-tolling services for Heavy Vehicles only
- Other countries with no e-tolling services
- Countries with e-tolling services interoperable with other countries



- Interoperability among different countries is achieved by means of agreements (involving technical, commercial and operational terms) signed by the different Toll Chargers and a number of international players (referred to as Toll Service Providers) offering e-tolling interoperable payment services
- National e-tolling schemes (in some case much wider than the EU-wide schemes) continue to be offered and operated

3.4 Case Study: the example of Austria

A nationwide multilane free-flow e-tolling scheme for Heavy Vehicles only (above 3,5 tons), based upon DSRC 5.8 GHz technology

- More than 2.000 km of toll motorways throughout the country
- Mandatory use of a DSRC-based OBU for the payment of the toll, distributed by:
  - Asfinag Maut Service GmbH, the national toll operator
  - a number of Toll Service Providers that have been accredited as interoperable providers offering the service to their clients from all over Europe

Axxes (F)	Telepass (I)
DKV Euroservice (D)	tolltickets (D)
Eurotoll (F)	TotalEnergies (F)
MS Europe (NL)	Eurowag (CZ)

!! Local users represent less than 25% of the customer base

GO
MAUTSYSTEM FÜR LKW UND BUS

4icom

3.4 Case Study: the example of Belgium

A GNSS satellite-based multilane free-flow e-tolling scheme for heavy vehicles, by which road users are charged for the use of all the public roads in the country (not only on the primary road network)

- Satellite-based positioning system with mandatory use of OBU that provides for the positioning data registration
- A tax is applied for the use of all the public roads in Belgium, on the base of the travelled distance that is measured on the base of GPS positions
- Road users may obtain an OBU by:
  - Satellic, the national toll operator running the system on behalf of the three regions of Belgium
  - a number of Toll Service Providers that have been accredited as interoperable providers offering the service to their clients from all over Europe:

Axxes (F)	Telepass (I)
Eurotoll (F)	TotalEnergies (F)
Toll4Europe (D)	

!! More than 50 % of road users is international

3.4 Case Study: the example of Italy

The largest (in terms of number of OBUs) e-tolling scheme in Europe, launched in 1990 but interoperable only since 2021

- About 6.000 km of toll motorway network, operated along a concession model by 28 different private and public operators
- E-Tolling service available at each of the more than 450 toll plazas and more than 2.000 lanes
- DSRC-based e-tolling service with non-mandatory OBU issued by one of the accredited Toll Service Providers

  Axxes (F) UnipolTech (I)
  DKV Euroservice (D)
- Parallelly to the interoperable Toll Service Providers, the incumbent national service provider (Telepass) continues to offer the service on the base of a national set of rules

!!!! 99 % of OBUs circulating in Italy are still not part of the EU interoperable service

3.5. Our Vision of Interoperability

The EU framework dictates a set of constraints to be met, interoperability across the region shall be achieved by adopting a business model coherent with it and with actual demand for interoperability

- **A DSRC-based e-tolling service offered by multiple entities throughout the Western Balkan Region**
  - Technology adapted to the extension of the tolled network and coherent with the EU Directive
  - Most efficient solution for an e-tolling service offered to all market segments
  - Investments made to be preserved, limited new investments to maintain coherence with the limited size of the interoperable market
- **An interoperable e-tolling service that coexists with the existing services at national level**
- **E-Tolling scheme operators may continue to play the role of Toll Charger and of Toll Service Provider**
- **Harmonized communication towards the users**
- **Business model**
  - OBUs shall support toll payment also along the tolled network in the other Regional Partners
  - National markets open to OBUs distributed by other service providers, in particular the toll operators of the other Regional Partners
  - Harmonized contractual framework among all parties, regulating roles, responsibilities, key processes and technical specifications
- **Exception handling and enforcement**
  - Harmonized rules and regulations for efficient handling of exceptions and for enforcement of violations
- **Further evolution**
  - Potential for interoperability with other countries to be considered on an opportunity basis

3.6 Free-Flow e-tolling systems – The concept behind these terms

Free-Flow and its relevancy for Western Balkans will be investigated in the second task (SWOT Analysis) of the project; we believe important to share a common vision on what lies behind this concept

- **All e-tolling schemes in operation worldwide (independently from the technology) are characterized by some free-flow operation, in the sense that they do not require vehicles to stop anymore at the toll plaza**
- **Nevertheless, the term Free-Flow e-tolling refers in fact to Multilane Free-Flow systems** (without any physical restriction to vehicles that do not even need to slow down)
    - Technically speaking, Free-Flow already exists in the Western Balkans Regional Partners
    - Multilane Free Flow goes further: complete removal of toll plazas and use of gantries (only where necessaries)
- **Key principles of Multilane Free-Flow:**
    - No physical constraints on traffic flow
    - Only electronic payment (via OBU or via License Plate Recognition)
    - Different technological options: DSRC 5.8 GHz (or other Tag & Beacon technologies) vs GNSS positioning, Mandatory vs Optional OBU, ANPR cameras for video tolling and/or exception handling
    - Possible for both Heavy Goods Vehicles and Light Vehicles, GNSS solution not yet efficient for light vehicles or for smaller road networks because of OBU pricing
    - Regular vs Occasional users
    - Compatible with pre-payment and post-payment schemes

3.6 Free-Flow e-tolling systems – Key implications

Multilane Free-Flow provides in theory for a greener, faster and more fair traffic management on motorways; however, all the consequences of its implementation must be considered

- **Migration (and investment for migration):** Cost of removing existing toll plazas can be significant
- **An adapted legal framework**
  - regulations must be adapted in order to consider specific operational constraints and to facilitate the toll collection
- **Detection and Management of violations**
  - a sensitive issue for Multilane Free-Flow: risk of multiplying violations and of significant loss of revenues
  - legal limitations with regards to identification and enforcing of international users
  - accurate design of the toll collection process to effectively handle exceptions
- **Expected adoption level (cultural barriers, technological barriers, legal barriers, etc.).**
  - multilane Free-Flow remains a not well-known technology for users
  - proper communication represents a key success factor, user must be carefully informed
  - social-economic implications not to be discarded
  - guidelines must also be provided regarding the handling of personal data

5. Discussion

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