BASELINE ASSESSMENT AND FINANCIAL IMPLICATION E-TOLLING INTEROPERABILITY

Transport Community - 9th Road Technical Committee

BELGRADE 20221005

Agenda

1. The objective and structuration of the study
2. Task 1 and Task 2: main conclusions
3. Task 3: Impact assessment
4. Next steps

1. Objectives and structuration of the study

Organization of the Study – Objectives

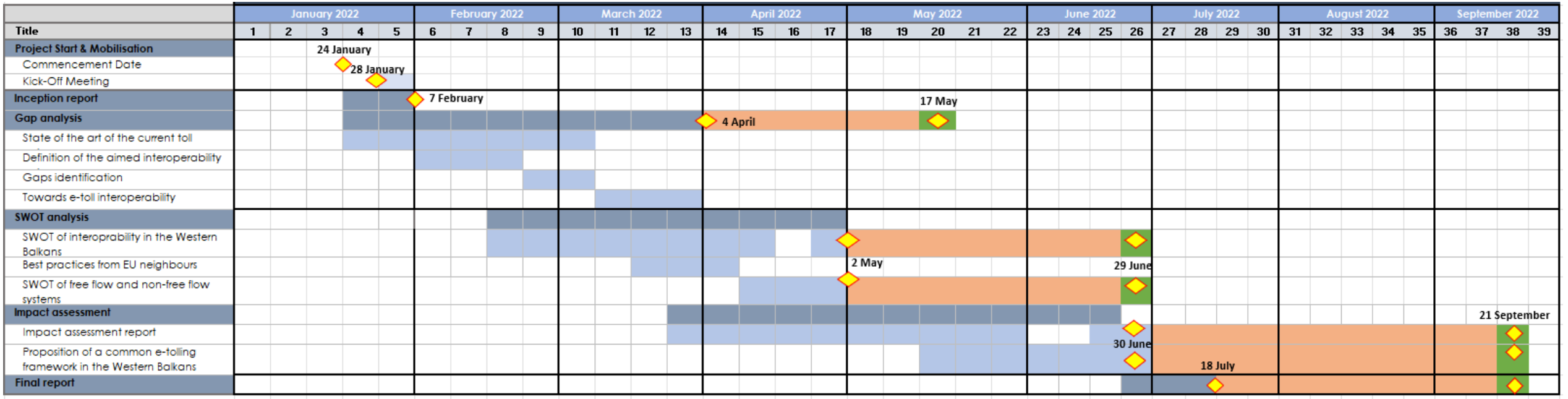
The aim of the study was to provide a picture of e-tolling in the Western Balkans and explore the potential transition towards an interoperable system

The main objectives related to this were:

- Provide an assessment of the systems currently deployed in all Regional Partners
- Understand the requirements from the European Directives linked to the implementation of e-tolling interoperability
- Highlights the key impacts of e-tolling interoperability on the road network, as well as the impact related to the type of system selected (free flow or non-free flow)
- Estimate the financial costs and benefits related to the implementation of an interoperable system

Overall, the underlying goal is to provide a perspective in which the Western Balkans Regional Partners could progressively be interoperable, based on the EU Directive 2019/520. The final goal is to integrate their transport markets with the European Union's.

Project Schedule



2. Task 1 and Task 2: Main conclusions

The learnings from Task 1

Regional Partner	Motorway network up to standards (2022)	Tolled network	Motorway network (2032)	Toll charger and operator	Public / Private	E-tolling solution	OBU provider
Albania	190 km	120 km		Albanian Road Authority	Private	5.8 GHz DSRC	
Bosnia & Herzegovina	217 km	217 km	910 km	JP Autoceste (FBiH) and RS Motorways (RS)	Public	5.8 GHz DSRC	Kapsch
Kosovo*	190 km	N/A	337 km (min.)	N/A	Public	N/A	N/A
North Macedonia	242 km	242 km		PE for State Roads	Public	5.8 GHz DSRC	Kapsch
Montenegro	0 km	5 km	264 km	Monteput	Public	5.8 GHz DSRC	N/A
Serbia	830 km	830 km	1830 km	PE Roads of Serbia	Public	5.8 GHz DSRC	Kapsch

Figure 1: Key information about tolling in the Western Balkans Regional Partners

*This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence

The learnings from Task 2

- **Task 2**: **SWOT analysis delivered on the 2nd of May**.
  - E-tolling interoperability makes sense regardless of the system (free flow or non-free flow)
    - Increased traffic (goods & persons)
    - Increased revenues: transactions and secured transactions recovery
  - The main differences of the two solutions for the Western Balkans:
    - Traditional systems (with barriers):
      1. The core of the WB network and adapted to interoperability
      2. Ensure financial sustainability of revenues
      3. Already adopted by the users
      4. Risk: progressive obsolescence in the next 10-20 years
    - Free flow systems need to be anticipated and will be compatible with the current system
      1. New and growing technology in Europe
      2. Positive effects on traffic and ecological impact
      3. Risk: user acceptance of the new system

3. The challenges and implications of Task 3

Impact Assessment – Our solution reach interoperability

We recommend to have a step-by-step approach and to distinguish two phases:

1. The Intermediate solution: in this solution, e-tolling interoperability can be achieved at regional level only, without merging it with the EU-wide interoperable services on the base of the EU Directive 2019/520/EC

The toll operators currently managing e-tolling services will set-up a common e-tolling service

- Toll operators may continue to act as toll service providers by issuing OBUs that can be used on the Western Balkans network
- Each toll operator will accept the transactions generated by the OBUs of the other toll operators
- Toll operators will consolidate all toll transactions registered across all tolling facilities with its own OBU and will charge the client accordingly
- Toll operators will guarantee to all the other toll chargers the payment of the toll due to its clients (use of the corresponding toll charger's network)

2. **The final solution:** in this solution, e-tolling interoperability is achieved at the scale of the EU on the base of the EU Directive 2019/520/EC
    - The main challenge of this phase is to open-up the market to other third parties (EETS providers) from outside the region

Impact Assessment – Economic impacts of interoperability

Implementation costs	Estimated value (per toll operator)
Design activities to define the characteristics of the service (inc. Agreements)	300.000 to 500.000 €
Upgrade of the back-office infrastructure	500.000 to 1.000.000 €
Testing and compliance of all technical elements	100.000 to 200.000 €
Purchase and installation of new e-tolling toll lanes	30.000 to 50.000 € (per lane)

Financial benefits	Estimated impact (network scale)
Increase of e-tolling penetration for LV	+5%
Increase of e-tolling penetration for HGV	+10-15%
Reduction of the payment transaction fees	0.5%-0.8% compared to 3 to 4% (card)
Reduction of the number of employees involved at toll plazas. New tasks are to be defined.	Not on a linear basis

Impact Assessment – Potential impacts of free flow

Implementation costs	Estimated value (per toll operator)
Multilane free-flow charging points	350.000 €
Setting-up of a back office to support transactions through OBUs and through License plate accounts	4.000.000 to 5.000.000 €
Potential loss of revenues (toll evasion / international traffic) LV	Up to 20% (at go live)
Potential loss of revenues (toll evasion / international traffic) HGV	Up to 6% (at go live)
Additional resources to handle transactions and exceptions associated to the back-office (image review, fraud management, etc.).	Variable but higher at the start of operation

Financial benefits
Less human resources at toll stations and new missions
Less energy costs
Reduced maintenance costs for RSE
Less public occupancy costs

Impact Assessment – Socio-eco benefits of free flow

LPV	in second			
	Classic TollGate - Card Transaction	Interoperability - with stop	Interoperability - 30 km/h	Free Flow
Decelaration Phase 1km	56	56	56	
Acceleration Phase 500m	20	20	20	
Go through Toll Gate - 30 km/h			2,4	
Stop at the toll gate (with ETC)		30		
Stop at the toll gate (card payment)	80			
No stop				45
Total	156	106	78,4	45

Speed limit 120 km/h

HGV / Buses	in Second			
	Classic TollGate - Card Transaction	Interoperability - with stop	Interoperability - 30 km/h	Free Flow
Decelaration Phase 1km	61,7	61,7	61,7	
Acceleration Phase 500m	25,7	25,7	25,7	
Go through Toll Gate - 30 km/h			2,4	
Stop at the toll gate (with ETC)		45		
Stop at the toll gate (card payment)	120			
No stop				60
Total	207,4	132,4	89,8	60

Speed limit 90 km/h

- We made a model to estimate the impact of e-tolling and free flow on time savings
- Time-saving can be linked with a financial impact
- A regular card transaction at a toll station lasts around 156 seconds (LV)
  - E-tolling with stop: -50 sec
  - E-tolling 30 km/h: -77,6 sec
  - Free flow: 111 sec
- We can then estimate the time savings for one stop and determine the total time savings for all the transactions over a year
- FBiH: 60 “man years” (eq. 2.630.000 €) could be saved per year

Impact Assessment – Environmental benefit of Free Flow

	LPV	HGV	TOTAL
Delta Consumption in liter for stop (Compare to Free Flow)	0,15	1,50	
Delta Consumption in liter for interoperability at 30km/h (Compare to Free Flow)	0,05	0,50	
Number of Vehicles per year	11 719 474	1 159 049	
Number of Additional liters with a stop	1 757 921	1 738 574	3 496 495
Number of Additional liters with interoperability at 30km/h	585 974	579 525	1 165 498
Addidtional CO2 Emission with Stop	4 219 011	4 172 576	8 391 587
Addidtional CO2 Emission with Interoperability	1 406 337	1 390 859	2 797 196
CO2 tons Price - Dec 2021 : 80 EUR			
Yearly CO2 cost savings by free flow compare to classic lane with a Stop per year	337 520,85 €	333 806,11 €	671 326,96 €
Yearly CO2 cost savings by free flow compare to classic lane with e-interoprability 30km/h	112 506,95 €	111 268,70 €	223 775,65 €

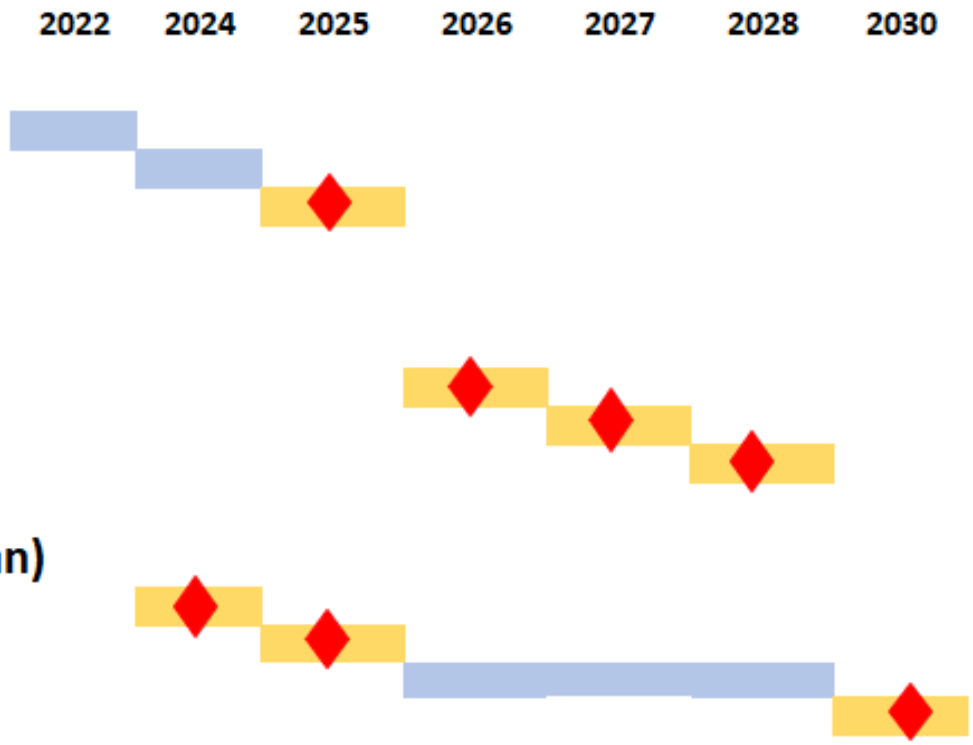
- We made a model to estimate the impact of e-tolling and free flow on gas savings
- Gas savings can be linked with a financial impact
- Full stop or slow-downs at stations required more gas, especially for HGVs.
- Additional consumption implies additional CO2 emission for each stop
- The price of one ton of CO2 is 80 €
- At the scale of a year, considering all transactions, important savings could be made (FBIH):
  - 1.6 M€ through gas purchase (0.4624 €/l)
  - 670.000€ through CO2 savings

=> In total (time savings + gas savings) for free flow: around 5 M€ for FBiH

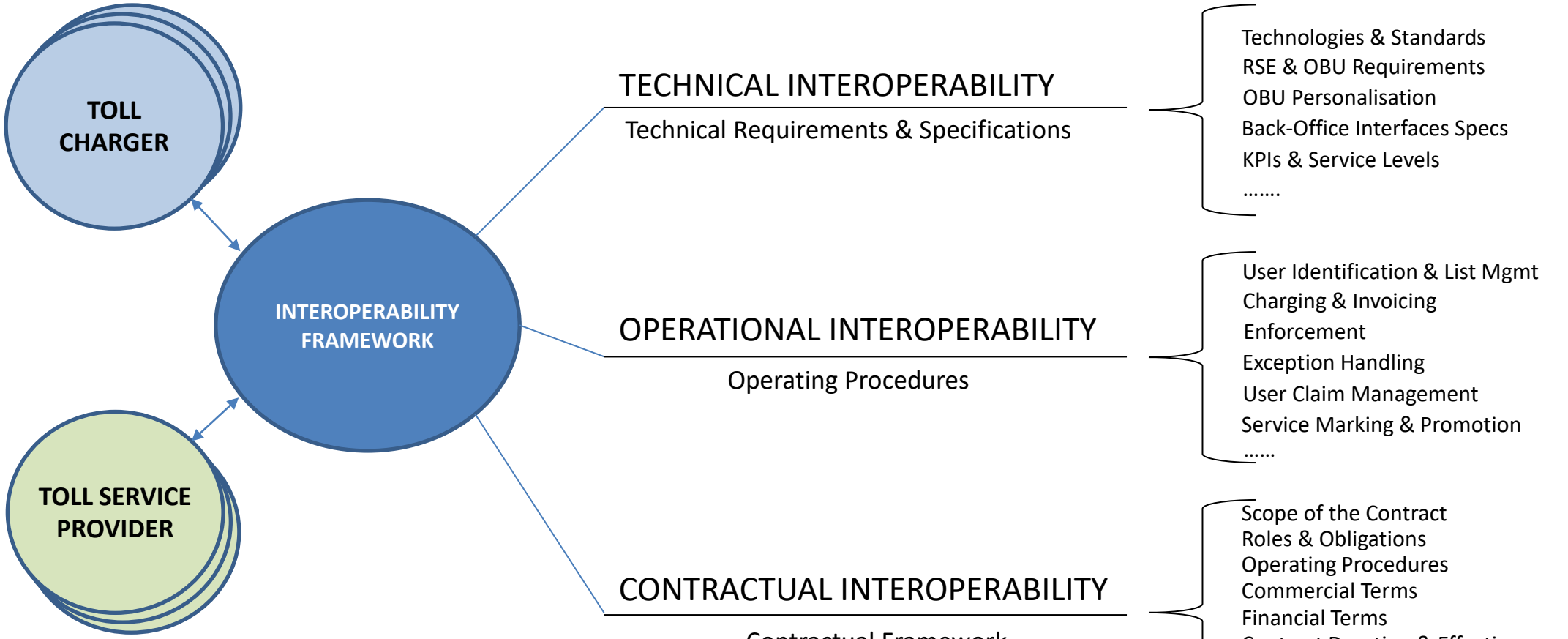
4. Next steps

Next steps

	Level
Regional Interoperability	
Definition of the project (objectives and rules)	WB- R
Tests (to obtain accreditation)	WB- R
Launch of the regional interoperability service (Go-live)	WB- R
EU Interoperability	
Validation of the project	WB- R
Official publication of the Toll Domain statements of each RPs	WB- R
Launch of the regional interoperability service (Go-live)	WB- R + EETS
Free Flow Solution (integration into the interoperability plan)	
Decision to include free flow into the RPs' interoperability plan	WB- R
Decision of the 1st Free Flow projects voted by one Regional Partner	WB- R
Interoperable license plate database **(see details below)**	WB- R
Launch of the free flow systems (go-live)	WB- R



E-TOLLING INTEROPERABILITY FRAMEWORK



4ICOM CONTACTS

CONTACT US

4icom Paris

11, rue du Chevalier St George

75008 Paris
France
FR 06 431 578 509

Emmanuel GRANDSERRE
-Managing Director-
4icom Paris
M: +33 6 08 48 94 81
E: emmanuel.grandserre@4icom.com

4icom Italia SrL

Via Ombrone 14

Rome 00198 - Italy

IT 06 499 100 482

Sergio BATTIBOIA
-Managing Director-
4icom Italia SpA
M: +39 335 105 2391
E: sergio.battiboia@4icom.com