



Support study for the Impact Assessment for the Revision of EETS Legislation

(Directive 2004/52/EC & Decision 2009/750/EC)

Final report Annexes for [European Commission - DG MOVE](#)
MOVE/D3/2015-560 and MOVE/D3/2016-648



**Transport and
Environmental
Policy
Research**



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1 Annex A – Additional findings and key assumptions from Tasks 1 - 3

1.1 Task 1.2 and 1.11: Key assumptions used in developing the modelling baseline

1.1.1 Cost assumptions for HDV on-board units

Table 1-1: Average costs and evolution

	2016	2020	2025
Share of EETS OBUs in the total OBU fleet	10%	15%	18%
Average yearly costs	€ 108.6	€ 110.8	€ 112.0

Table 1-2: EETS OBU costs - via EETS providers

Cost category	Direct costs				Time losses		Indirect costs	
	Rental or deposit	Service fees	Installation	Driver training	Installation + removal time	Registration time for vending machine	Administrative costs	Fines
Unit	€/OBU	€/OBU	€/OBU	€/OBU	€/OBU	€/OBU	€/OBU	%fines/journey
Average yearly costs	30	60	0	1.95	0	0	55.28	0

Total cost:	€147.2
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Table 1-3: Toll provider direct - average yearly costs

Cost category	Direct costs				Time losses		Indirect costs	
	Rental or deposit	Service fees	Installation + removal	Driver training	Installation + removal time	Registration time for vending machine	Administrative costs	Fines
Unit	€/OBU	€/OBU	€/OBU	€/OBU	€/OBU	€/OBU	€/OBU	%fines/journey
Austria	13.75	6.00	12.50	3.91	0.00	0.00	55.28	0
Belgium (Viapass/Satellitic)	10.13	6.00	3.50	7.81	5.08	4.48	55.28	0
Czech Republic	17.00	6.00	0.00	3.91	0.00	0.00	55.28	0
Germany (Toll Collect)	5.00	6.00	54.38	7.81	53.75	0.00	55.28	0
Hungary	1.13	6.00	17.50	7.81	31.25	0.00	55.28	0
Poland (Viatoll)	13.00	6.00	0.00	3.91	0.00	0.00	55.28	0
Slovakia	15.88	6.00	0.00	7.81	0.00	0.00	55.28	0
Average	10.84	6.00	12.55	6.14	12.87	0.64	55.28	0.00

Total cost:	€104.3
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Table 1-4: OBU administrative costs – average yearly costs

Cost category	Administrative costs	
Unit	€/OBU	Assumptions
Road Haulage Company 1	72.12	- OBU fleet management: 1 hour per day for 4 persons - Invoicing: 2 hours per day for 1 person - 8 OBUs/truck
Road Haulage Company 2	26.79	- OBU fleet management: 1 day per month - Invoicing: 1.5 days per month - 280 OBUs
Road Haulage Company 3	38.23	- 2 hours a week - 3 OBUs/truck
Road Haulage Company 4	84.00	- €700 per month - 5 OBUs
Average cost:	€55.28	

Table 1-5: Other assumptions related to the costs of HDV OBUs

Scope	Assumptions		Comments
All	Average lifecycle time of an OBU (years)	4	The lifetime depends both on the turnover of truck fleet (4 to 5 years), the durability of the OBUs (e.g. Toll Collect OBUs are said to last up to 7 years), the innovation in the field of OBU device and the possible increase in ETS provider switching as new players enter the market.
All	Average daily pay rate of a truck driver	€250	We take an average for Europe. The income rate of truck drivers across Europe is very variable (>€2,500/month in Western Europe, from €1,000€ to €1,700/month in Eastern Europe)
All	Rate of non-refunded OBU deposit within a lifecycle	30%	Possible causes for non-return: fixed installed and kept long term, lost or damaged so not refunded, kept inactive for or than 1 year (CZH)
EETS OBUs	Average number of Toll Domains covered for a EETS OBU	3	This figure is today lower but should increase over time (and quite rapidly)
EETS OBUs	Average monthly paid toll with an OBU	€1,000	<p>This is the basis for calculation of the service fees by the EETS providers. It corresponds to the average amount of toll paid by the user for the distance driven in the networks covered by the OBUs of the EETS provider.</p> <p>For example, the average for France is €450. For companies driving a lot, and on 3-4 toll domains it can reach up to €1,500.</p>
EETS OBUs	Average service fees applied by EETS providers	0.5%	<p>This rate varies a lot, depending on the business relationship between the haulier and the EETS provider (see remark in column E).</p>
			<p><u>Remark on costs charged by EETS Providers:</u> 2 items constitute the cost charged by the providers to the transport companies: a fixed rental fee for the OBU and a variable service fee calculated as a % of the toll paid on the covered toll domains. The amount (and rate) of these costs significantly fluctuate from one client to another and from one provider to another, and they are a key aspect of the business strategy of the providers (e.g. for many big hauliers the service fees are set</p>

Scope	Assumptions		Comments
<i>EETS OBUs</i>	Average monthly "rental" cost for an OBU	€2.50	Today, this amount is often calculated on the basis of the number of toll domains covered by the OBU (e.g. €1/month per toll domain) but it will most likely stay stable even if the average number of toll domains per OBU will increase, as it is a key commercial component for EETS providers (see remark in column E). to 0% while small ones can be charged up to 2%).
<i>Viapass</i>	Rate of fixed installation in truck	20%	In the case of the Satellic OBU, a fixed installation means installing cables directly connected to the truck battery to avoid using cigarette lighter.
<i>Viapass</i>	Share of OBUs delivered at Service Points (i.e. the truck drivers stop at a Service Point and collect an OBU from an automated distribution machine)	20%	The average time spent for a truck driver to reach a Service Point and collect the OBU is evaluated at 30 minutes
<i>Viapass</i>	Share of OBUs returned at Service Points (i.e. the truck drivers stop at a Service Point and return the OBU at an automated distribution machine)	13%	The average time spent for a truck driver to reach a Service Point and return the OBU is evaluated at 20 minutes
<i>Viapass</i>	OBU replacement at SO due to defective OBU (rate for each OBU per year)	25%	According to several hauliers, about 1 defect per OBU per year (mainly SW problems). There is different possibility but in 50% of the cases, the driver needs to swap OBU at Service Point NB: admin costs can be also involved but we assume they are included in the admin costs
<i>Viapass</i>	Time to SWAP OBU at SP	0.03125	15 min
<i>Toll Collect</i>	Rate of non-refunded OBU deposit within a lifecycle	5%	Other cause: if a truck is sold with the OBU inside
<i>Toll Collect</i>	Share of OBUs which are switched or removed from a truck (thus, de-installed) within a lifecycle	90%	The lifetime of a truck is of about 5 years, so within a 4 years lifecycle (basis for OBU) almost all OBUs will have been removed or switched once.
<i>National OBUs</i>	Average monthly paid toll with an OBU	€250	We take the assumption that the average toll paid by a truck in a month is €1000. This figure can be higher for trucks driving

Scope	Assumptions		Comments
			mainly in Western Europe (e.g. Austria) and lower for trucks driving mainly in Eastern Europe. We assume that the average number of OBUs per truck is 4.
<i>National OBUs</i>	Average fees for bank guarantee	0.2%	This fluctuates significantly from one company to another as it is linked to the contractual terms of the relationship between the fuel card provider and the haulier and that the main object of the fees is the fuel expenses which are much higher than the cost of toll.

1.1.2 Cost assumptions for private cars

Table 1-6: Cost assumptions for private cars - annual fees (€)

	Occasional user	Frequent user	Comment	OBU fleet (2014/2015)	Penetration	Links
France : Average of ETS Providers	9	19	Multiple badges (>2), incl VAT, including all fees	5,858,071	18%	http://www.telepeages.fr http://www.cdfa.fr/IMG/pdf/cpparcfrance_2016ok-2.pdf
Portugal : Via Verde Leve/Compra	8.40	22.00	Single badge, shipping cost not included	3,693,055	82%	https://www.viaverde.pt/viaverde/como-aderir
Spain : Pagatelia	4.40	6.15	Number of badges not indicated, Occasional tariff applies €1.10 per month when the badge is used	1,600,000	7%	http://www.pagatelia.com/tarif-as-viat#tarifa-usuario-frecuente
Ireland : eFlow Tag account	14.76		With minimum start-up balance of €40 and monthly fee			https://www.eflow.ie/help-guidance/downloads/D5707-eFlow-Customer-Agreement-Ts-and-Cs-AUG-20151.pdf
Italy	cf. Italian website	cf. Italian website	cf. Italian website	8,000,000	25%	http://www.telepass.it/ecm/faces/public/telepass/home/servizio-clienti/modulistica.html

1.1.3 Origin-destination pair OBU baseline assumptions

1.1.3.1 2016 number of OBUs required for each origin-destination pair (yellow cells indicate where some interoperability already exists)

Country (load)	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	LI	NO	CH	AL	BA	MK	XK	ME	RS	BY	RU	TR				
Austria	AT	3/4/	3/4/	3/4/		2	2,5/3,5			2/3/	1.50	5/6/	2		2	5	4	2		1.50	3/4/	3	2/3/	2	2	3	2,5/3,5	3/4/	1	4/5/	2	3/4/5/	3	4/5/	4/5/		3/4/	4	5/6/	3/5/6/				
Belgium	BE		5/7/	5/6/	3/4/	2/4/	5/6/	2/5/6/		1.86	2	5/7/9/	4/5/	2/3/	2/4/	5/6/	4/5/	1		1	3/4/	2/4/	4/5/	4/5/	4/5/	3	2/5/	1/2/	2/5/	4	5/6/		5/7/	5/7/	4/5/	5/6/	6/7/9/							
Bulgaria	BG			2/3/	2	4	6	5/8/	5/7/9/	3/5/6/	4/5/	1	2	6/7/	3/4/	5/8/	4/7/	4/5/6/	2	3/5/	5	4/7/8/	0	3	3	3/6/	5/7/8/	7	5/6/	7/8/	6/7/	2	2	2	2/3/		2	3/6/	2/3/	2				
Croatia	HR					4	5			4/5/	4	2/4/	2		2/3/					3	5		2	3	2					4	1/3/	1	2/3/	1/3/	1	2								
Cyprus	CY										3/7/	2																3/8/																
Czech Republic	CZ						3			3/4/	2	6/7/	3		3/4/	4	3	2		2	2	5	3	2	3	4/5/	3/4/	4/5/	4	3	4/5/	4	5/6/	5/6/		4/5/	3	4	4/6/					
Denmark	DK							1/2/5/	3/4/5/	2		5	2/3/6/	4	2/4/5/	2/4/	2			2	3	5/6/	5/6/	4		4/5/	2	1/5/	2/3/	3							4	2/5/	5/7/8/					
Estonia	EE							0	5/6/	4			6	1	2				5	1/3/						1		2										2/3/	1	10				
Finland	FI							2/5/6/	1/3/4/			3/5/6/	5/6/	1	2			2/4/5/	1/3/							3/6/	1	2											2/3/	1	2/8/9/			
France	FR									2	3/7/8/	4/5/	2	1.95	5/6/	4/5/	1		1.86	3	1/2/	4	4/5/	3/4/	1	4/5/	1	3/4/5/	2		4/5/		5/6/	5/6/	4/5/	5/6/	4/5/	5/6/	4/5/	5/6/	3/7/8/			
Germany	DE									4/6/7/	3/4/	2/4/5/	3	4	3	1			1	2	4/5/	3/4/	3	3	3/4/	2/3/	2/3/4/	2	3	2	4/5/6/	4	5/6/	4/5/	4/5/	4/5/	3	4	4/6/7/					
Greece	GR										4		4		2/6/			3/6/7/	4/6/	6/7/	4/9/	2			3/8/	8/9/10/	4/8/			1	1/2/3/	2	2	3			3			2		4		
Hungary	HU												5/6/	3	5/6/	4/5/	3/4/		3	3/4/	6	1	2	2	5/6/	4/5/6/	4/5/		6/7/	4	3/4/	2	3/4/	2/3/	2	4/5/	2/5/6/	2						
Ireland	IE														3/4/5/				1/3/	4/5/6/		5/6/8/				2/3/		1													5/8/9/			
Italy	IT												6	5	2.475	3/4/5/	4/5/	4	3/4/	3/4/	2	3	5	2/3/4/	2	5	2				2/5/	1/4/	2/4/					6/7/	2/6/					
Latvia	LV															5	3									4/6/7/	2	6/7/	3								2	2	10					
Lithuania	LT																		4	2			3		5/6/	2	5/6/	3	4								2	3	8					
Luxembourg	LU																		1	2						1		2/3/		3											5/7/8/			
Malta	MT																																											
Netherlands	NL																				2	2/4/	3	3	3	3	2	1/3/		2/4/	3/5/		5	5	5	4	3/5/	5/7/						
Poland	PL																				5/6/	3/4/	2	4/5/	4/5/	2/4/	3/4/5/	3/4/	3		4/5/	6	5/6/	5	2	3/4/	7/8/							
Portugal	PT																									1		1/4/	4													9		
Romania	RO																						2	2/3/	5/6/	4/5/6/	5/6/8/	6/7/	5	3				3	2						3			
Slovak Republic	SK																								3	5/6/	3/4/5/	4/5/					3	4	4	3	3	4	5					
Slovenia	SI																									4/5/	5	4/5/									3	5	6	3/5/				
Spain	ES																										5/6/	1/2/	5/6/	3	5/7/	7	6				6	5/6/	6/7/	4/8/10/				
Sweden	SE																											1/6/	2	4										1/2/3/	6/9/			
United Kingdom	UK																												2												6/7/			
Liechtenstein	LI																												1															
Norway	NO																																											
Switzerland	CH																																											
Albania	AL																														4/5/	6/7/	5/6/	5/6/	4									
Bosnia	BA																																											
Macedonia	MK																																											
Kosovo	XK																																										3	
Montenegro	ME																																										3	
Serbia	RS																																											
Belarus	BY																																											
Russia	RU																																										2	
Turkey	TR																																											

Table 1-7: Origin-destination pair OBU number assumptions for 2016

Origin	Destination	Assumptions
AT	DK	Contractual interoperability via "EasyGo" between Danmark and Austria, allowing trucks to use a same OBU for the 2 countries
AT	DE	The interoperability between Germany and Austria is offered via the German Toll Collect OBU (only), which can be activated for Austria also. About 10% of German OBUs are activated for Austria. We assume that this 10% account for 50% of the users regularly operating in Austria and Germany : - most non-Austrian frequent users have this solution - but most Austrian users keep the Austrian OBUs so need to have 2 OBUs for the 2 countries
AT	LU	Average of AT-FR and AT-DE
AT	NL	Same as AT-DE
AT	SE	Contractual interoperability via "EasyGo" between Sweden and Austria, allowing trucks to use a same OBU for the 2 countries
BE	FR	14% of OBUs used in Belgium are provided by Axxès and thus fully interoperable with France
BE	LU	Only the Belgian OBU
BE	NL	Only the Belgian OBU
BG	NL	Same as BG-DE
HR	NL	Same as HR-DE
CZ	NL	Same as CZ-DE
DK	LU	Same as DE-DK
DK	NL	Same as DK-DE
FR	IT	We know that around 100,000 OBUs are interoperable for FR and IT, mostly owned by Italian trucks. It is hard to evaluate the share units actually circulating in the 2 countries represents. We can reasonably set this assumption to 5%.
FR	LU	Only the French OBU
FR	NL	Same as FR-BE
FR	PT	Most ETS providers operating in France offer interop in PT, which is not reciprocal. The Country crossed is Spain, which is interoperable with both.
FR	ES	Most ETS providers operating in France and Spain offer interoperability between the 2 countries

Origin	Destination	Assumptions
DE	LU	Only the German OBU
DE	NL	Only the German OBU
IT	LU	Average of IT-FR and IT-DE
IT	NL	IT-BE or IT-DE
LU	NL	Only 1 OBU needed: either the German one or the Belgian one
LU	PL	Same as PL-DE
LU	ES	Same as ES-FR
NL	PL	Same as PL-DE
NL	PT	Same as PT-BE
NL	SI	Same as SI-DE
NL	ES	Same as ES-BE
NL	SE	Same as DK
PT	ES	80% of the Spanish network is interoperable (the remaining 20% hardly impacted by binational transport). And many ETS providers operating in Spain offer interop with Portugal

No charging schemes for HDVs in:	
Finland	FI
United Kingdom	UK
Cyprus	CY
Estonia	EE
Malta	MT
Albania	AL
Bosnia Herzegovina	BA

No charging schemes for HDVs in:	
Montenegro	ME
Kosovo	XK

1.1.3.2 2020 number of OBUs required for each origin-destination pair (yellow cells indicate where some interoperability is expected to exist)

Country (load)	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	LI	NO	CH	AL	BA	MK	XK	ME	RS	BY	RU	TR		
Austria	AT	2.4	3/4/	3/4/		2	2.4			1,7/2,7/	1.50	5/6/	2		1.8	5	4	1.50		1.50	3	1.8	2/3/	2	2	1.8	2.4	3/4/	1	4/5/	2	3/4/5/	3	4/5/	4/5/	3/4/	4	5/6/	3/5/6/			
Belgium	BE		5/7/	5/6/		3/4/	2.7	5/6/	2/5/6/	1.7	2	5/7/9/	3,4/4,4/	2/3/	2.5	5/6/	4/5/	1		1	2.9	1.7	4/5/	4/5/	3.4	1.7	2.7	1/2/		2/5/	4		5/6/		5/7/	5/7/	4/5/	5/6/	6/7/9/			
Bulgaria	BG			2/3/	2	4	6	5/8/	5/7/9/	3/5/6/	4/5/	1	2	6/7/	3/4/	5/8/	4/7/	4/5/6/	2	3/5/	5	4/7/8/	0	3	3	3/6/	5/7/8/		7	5/6/	7/8/	6/7/	2	2	2	2/3/	2	3/6/	2/3/	2		
Croatia	HR					4	5			4/5/	4	2/4/	2		2/3/					4	5		2	3	2					4	1/3/	1	2/3/	1/3/	1	2						
Cyprus	CY										3/7/	2																3/8/														
Czech Republic	CZ						3			3/4/	2	6/7/	3		3/4/	4	3	2		2	2	5	3	2	3	4/5/	3/4/	4/5/		4	3	4/5/	4	5/6/	5/6/		4/5/	3	4	4/6/		
Denmark	DK								1/2/5/	3/3,7	2		5	2/3/6/	3.2	2/4/5/	2/4/	2		2	3	3/3,7	5/6/	4	3.4	3/3,7	2	1/5/		2/3/	3						4	2/5/	5/7/8/			
Estonia	EE								0	5/6/	4				6	1	2			5	1/3/						1											2/3/	1	10		
Finland	FI									2/5/6/	1/3/4/		3/5/6/		5/6/	1	2			2/4/5/	1/3/					3/6/	1			2								2/3/	1	2/8/9/		
France	FR										2	3/7/8/	4/5/	2	1.8	5/6/	4/5/	1		1.7	2.9	1	4	4/5/	2.8	1	3/3,7		1		3/4/5/	2		4/5/		5/6/	5/6/	4/5/	5/6/	3/7/8/		
Germany	DE											4/6/7/	3/4/	2/4/5/	2.8	4	3	1		1	2	2	3/4/	3	3	2	2	2/3/4/	2	3	2	4/5/6/	4	5/6/	4/5/	4/5/	3	4	4/6/7/			
Greece	GR												4		2/6/			3/6/7/		4/6/	6/7/	4/9/	2			3/8/	8/9/10/	4/8/			1	1/2/3/	2	2	3				2			
Hungary	HU													5/6/	3	5/6/	4/5/	3/4/		3	3/4/	6	1	2	2	5/6/	4/5/6/	4/5/		6/7/	4	3/4/	2	3/4/	2/3/	2	4/5/	2/5/6/	4			
Ireland	IE														3/4/5/					1/3/	4/5/6/		5/6/8/			2/3/		1											5/8/9/			
Italy	IT															6	5	2.3		1,8/2,8/	3.8	1.8	3/4/	3/4/	2	1.8	3.2	2/3/4/	2	5	2			2/5/	1/4/	2/4/		6/7/	2/6/			
Latvia	LV																2			5	3				4/6/7/	2	6/7/	3								2	2	10				
Lithuania	LT																		4	2			3			5/6/	2	5/6/	3	4							2	3	8			
Luxembourg	LU																			1	2					1		2/3/												5/7/8/		
Malta	MT																																									
Netherlands	NL																				2	1.7	3	3	3	1.7	2	1/3/		2/4/	3/5/		5		5	5	4	3/5/	5/7/			
Poland	PL																					2.9	3/4/	2	4/5/	2.9	3	3/4/5/	3/4/	3		4/5/	6	5/6/	5	2	3/4/	7/8/				
Portugal	PT																								1		1/4/		4											9		
Romania	RO																						2	2/3/	5/6/	4/5/6/	5/6/8/	6/7/	5	3					3	2				3		
Slovak Republic	SK																								3	5/6/	3/4/5/	4/5/		4		3	4	4	4	3	3	4	5			
Slovenia	SI																								2.8	3.4	4/5/		3	2/4/	2	4	3/4/	3	5	6	3/5/					
Spain	ES																									3/3,7	1/2/	5/6/	3		5/7/	7	6		6	5/6/	6/7/	4/8/10/				
Sweden	SE																											1/6/		2	4							1/2/3/	6/9/			
United Kingdom	UK																																						6/7/			
Liechtenstein	LI																													1												
Norway	NO																																									
Switzerland	CH																																4/5/	6/7/	5/6/	5/6/	4					
Albania	AL																																									
Bosnia	BA																																									
Macedonia	MK																																								3	
Kosovo	XK																																								3	
Montenegro	ME																																									
Serbia	RS																																									
Belarus	BY																																									
Russia	RU																																								2	
Turkey	TR																																									

Table 1-8: Origin-destination pair OBU number assumptions for 2020

Origin	Destination	Assumptions
AT	BE	Main route from AT to BE is via DE. Since DE is not open in 2020 in the baseline scenario and that trucks frequently operating in AT and DE have 50% of the time a German Toll Collect OBU, we assume that the number of users on this route using EETS OBUs will be limited: 10% out of the 30% penetration in AT and BE.
AT	DK	Same logical and context as AT-BE
AT	FR	Penetration rate of AT is 30% while FR is 100%
AT	DE	The interoperability between Germany and Austria is offered via the German Toll Collect OBU (only), which can be activated for Austria also. About 10% of German OBUs are activated for Austria. We assume that this 10% account for 50% of the users regularly operating in Austria and Germany : <ul style="list-style-type: none"> - most non-Austrian frequent users have this solution - but most Austrian users keep the Austrian OBUs so need to have 2 OBUs for the 2 countries
AT	IT	IT should have a penetration rate of 20%, while neighbouring AT 30%
AT	LU	Average of AT-FR and AT-DE
AT	NL	Same as AT-DE
AT	PL	Number of OBUs required will only slightly decrease (with opening of AT and limited opening of PL) as the routes includes CZH and SK.
AT	PT	All crossed countries are in the group of countries that should have a high rate of interop. The less mature one should be Italy with 20%
AT	ES	All crossed countries are in the group of countries that should have a high rate of interop. The less mature one should be Italy with 20%
AT	SE	Same as DK
BE	DK	- 1 OBU for DE - 1.7 OBUs for BE and DK
BE	FR	BE should have penetration of about 30% while FR 100%
BE	HU	BE-AT +1/+2 OBUs
BE	IT	IT is the driver which should have a penetration of 20%
BE	LU	Only the Belgian OBU
BE	NL	Only the Belgian OBU

Origin	Destination	Assumptions
BE	PL	- 1 OBU for DE - 1.9 OBUs for BE and PL
BE	SI	AT-BE +1OBU
BE	SE	Same as DK
BG	NL	Same as BG-DE
HR	NL	Same as HR-DE
CZ	NL	Same as CZ-DE
DK	FR	3 OBUs via DE or 3.7 via BE
DK	IT	DK-AT +0.8 OBUs
DK	LU	Same as DE-DK
DK	NL	Same as DK-DE
DK	SI	AT-DK +1 OBU
FR	IT	20% penetration in IT
FR	LU	Only the French OBU
FR	NL	Same as FR-BE
FR	PL	10% of penetration in PL brings PL-FR interoperability
FR	PT	Most ETS providers operating in France offer interop in PT, which is not reciprocal. The Country crossed is Spain, which is interoperable with both.
FR	SI	FR-IT +1 OBU
FR	ES	Most ETS providers operating in France and Spain offer interoperability between the 2 countries
FR	SE	Same as DK
DE	IT	AT-IT +1 OBU
DE	LU	Only the German OBU

Origin	Destination	Assumptions
DE	NL	Only the German OBU
DE	PT	Same as DE-FR
DE	ES	Same as DE-FR
DE	SE	Same as DK
IT	LU	Average of IT-FR and IT-DE
IT	NL	IT-BE or IT-DE
IT	PL	PL-AT +0.8 OBUs (20% penetration rate in IT)
IT	PT	Same as IT-FR
IT	ES	Same as IT-FR
IT	SE	Same as DK
LU	NL	Only 1 OBU needed: either the German one or the Belgian one
LU	PL	Same as PL-DE
LU	ES	Same as ES-FR
NL	PL	Same as PL-DE
NL	PT	Same as PT-BE
NL	ES	Same as ES-BE
NL	SE	Same as DK
PL	PT	Same as FR-PL
PL	SI	Same as SI-DE
PL	ES	Same as FR-PL
PT	ES	80% of the Spanish network is interoperable (the remaining 20% hardly impacted by binational transport). And many ETS providers operating in Spain offer interop with Portugal

Origin	Destination	Assumptions
SI	ES	Same as FR-SI
SI	SE	Same as DK
ES	SE	Same as DK

No charging schemes for HDVs in:	
Finland	FI
United Kingdom	UK
Cyprus	CY
Estonia	EE
Malta	MT
Albania	AL
Bosnia Herzegovina	BA
Montenegro	ME
Kosovo	XK

1.1.3.3 2025 number of OBUs required for each origin-destination pair (yellow cells indicate where some interoperability is expected to exist)

Country (load)	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	LI	NO	CH	AL	BA	MK	XK	ME	RS	BY	RU	TR	
Austria	AT	2.3	3/4/	3/4/		2	2.3			1.5/2.5/	1.50	5/6/	2		1.7	5	4	1.50		1.50	2.9	1.7	2/3/	2	2	1.7	2.3	3/4/	1	4/5/	2	3/4/5/	3	4/5/	4/5/	3/4/	4	5/6/	3/5/6/		
Belgium	BE		5/7/	5/6/	3/4/	2.6	5/6/	2/5/6/	1.6	2	5/7/9/	3,3/4,3/	2/3/	2.3	5/6/	4/5/	1		1	2.85	1.6	4/5/	4/5/	3.3	1.6	2.6	1/2/	2/5/	4		5/6/		5/7/	5/7/	4/5/	5/6/	6/7/9/				
Bulgaria	BG			2/3/	2	4	6	5/8/	5/7/9/	3/5/6/	4/5/	1	2	6/7/	3/4/	5/8/	4/7/	4/5/6/	2	3/5/	5	4/7/8/	0	3	3	3/6/	5/7/8/	7	5/6/	7/8/	6/7/	2	2	2	2/3/	2	3/6/	2/3/	2		
Croatia	HR					4	5			4/5/	4	2/4/	2		2/3/					4	5			2	3	2				4	1/3/	1	2/3/	1/3/	1	2					
Cyprus	CY										3/7/	2																3/8/													
Czech Republic	CZ						3			3/4/	2	6/7/	3		3/4/	4	3	2		2	2	5	3	2	3	4/5/	3/4/	4/5/	4	3	4/5/	4	5/6/	5/6/	4/5/	3	4	4/6/			
Denmark	DK								1/2/5/	3/3,6/	2		5	2/3/6/	3	2/4/5/	2/4/	2		2	3	3/3,6/	5/6/	4	3.3	3/3,6/	2	1/5/	2/3/	3						4	2/5/	5/7/8/			
Estonia	EE							0	5/6/	4				6	1	2			5	1/3/							1		2								2/3/	1	10		
Finland	FI								2/5/6/	1/3/4/			3/5/6/		5/6/	1	2		2/4/5/	1/3/						3/6/	1		2								2/3/	1	2/8/9/		
France	FR									2	3/7/8/	4/5/	2	1.7	5/6/	4/5/	1		1.6	2.85	1	4	4/5/	2.7	1	3/3,6/	1		3/4/5/	2		4/5/		5/6/	5/6/	5/6/	4/5/	5/6/	3/7/8/		
Germany	DE										4/6/7/	3/4/	2/4/5/	2.7	4	3	1		1	2	2	3/4/	3	3	2	2	2/3/4/	2	3	2	4/5/6/	4	5/6/	4/5/	4/5/	3	4	4/6/7/			
Greece	GR											4		2/6/			3/6/7/			4/6/	6/7/	4/9/	2		3/8/	8/9/10/	4/8/			1	1/2/3/	2	2	3				2			
Hungary	HU												5/6/	3	5/6/	4/5/	3/4/		3	3/4/	6	1	2	2	5/6/	4/5/6/	4/5/		6/7/	4	3/4/	2	3/4/	2/3/	2	4/5/	2/5/6/	4			
Ireland	IE														3/4/5/					1/3/	4/5/6/		5/6/8/			2/3/		1											5/8/9/		
Italy	IT															6	5	2.2		1,7/2,7/	3,6	1.7	3/4/	3/4/	2	1.7	5	2/3/4/	2	5	2			2/5/	1/4/	2/4/		6/7/	2/6/		
Latvia	LV																2		5	3						4/6/7/	2	6/7/		3								2	2	10	
Lithuania	LT																		4	2			3		5/6/	2	5/6/	3	4									2	3	8	
Luxembourg	LU																			1	2					1		2/3/		3										5/7/8/	
Malta	MT																																								
Netherlands	NL																				2	1.6	3	3	3	1.6	2	1/3/	2/4/	3/5/		5		5	5	5	4	3/5/	5/7/		
Poland	PL																				2.85	3/4/	2	4/5/	2.85	3	3/4/5/	3/4/	3		4/5/	6	5/6/	5	2	3/4/	7/8/				
Portugal	PT																									1	1/4/	4													9
Romania	RO																						2	2/3/	5/6/	4/5/6/	5/6/8/	6/7/	5	3					3	3	2			3	
Slovak Republic	SK																								3	5/6/	3/4/5/	4/5/		4		3	4	4	3	3	4	5			
Slovenia	SI																									2.7	3.3	4/5/		3	2/4/	2	4	3/4/	3	5	6	3/5/			
Spain	ES																										3/3,6/	1/2/	5/6/	3		5/7/	7	6	6	5/6/	6/7/	4/8/10/			
Sweden	SE																											1/6/	2	4									1/2/3/	6/9/	
United Kingdom	UK																												2										6/7/		
Liechtenstein	LI																												1												
Norway	NO																																								
Switzerland	CH																																						4		
Albania	AL																																								
Bosnia	BA																																								
Macedonia	MK																																								
Kosovo	XK																																								
Montenegro	ME																																								
Serbia	RS																																								
Belarus	BY																																							2	
Russia	RU																																								
Turkey	TR																																								

Table 1-9: Origin-destination pair OBU number assumptions for 2025

Origin	Destination	Assumptions
AT	BE	Main route from AT to BE is via DE. Since DE is not open in 2025 in the baseline scenario and that trucks frequently operating in AT and DE have 50% of the time a German Toll Collect OBU, we assume that the number of users on this route using EETS OBUs will be limited: 20% out of the 40% penetration in BE.
AT	DK	Same logical and context as AT-BE
AT	FR	Penetration rate of AT is 50% while FR is 100%
AT	DE	The interoperability between Germany and Austria is offered via the German Toll Collect OBU (only), which can be activated for Austria also. About 10% of German OBUs are activated for Austria. We assume that this 10% account for 50% of the users regularly operating in Austria and Germany : - most non-Austrian frequent users have this solution - but most Austrian users keep the Austrian OBUs so need to have 2 OBUs for the 2 countries
AT	IT	IT should have a penetration rate of 30%, while neighbouring AT 50%
AT	LU	Average of AT-FR and AT-DE
AT	NL	Same as AT-DE
AT	PL	Number of OBUs required will only slightly decrease (with opening of AT and limited opening of PL) as the routes includes CZH and SK.
AT	PT	All crossed countries are in the group of countries that should have a high rate of interop. The less mature one should be Italy with 30%
AT	ES	All crossed countries are in the group of countries that should have a high rate of interop. The less mature one should be Italy with 30%
AT	SE	Same as DK
BE	DK	- 1 OBU for DE - 1.6 OBUs for BE and DK
BE	FR	BE should have penetration of about 40% while FR 100%
BE	HU	BE-AT +1/+2 OBUs
BE	IT	IT is the driver which should have a penetration of 30%
BE	LU	Only the Belgian OBU
BE	NL	Only the Belgian OBU

Origin	Destination	Assumptions
BE	PL	- 1 OBU for DE - 1.85 OBUs for BE and PL
BE	PT	Same as BE-FR
BE	SI	AT-BE +1 OBU
BE	ES	Same as BE-FR
BE	SE	Same as DK
BG	NL	Same as BG-DE
HR	NL	Same as HR-DE
CZ	NL	Same as CZ-DE
DK	FR	3 OBUs via DE or 3.6 via BE
DK	IT	DK-AT +0.7 OBUs
DK	LU	Same as DE-DK
DK	NL	Same as DK-DE
DK	PT	Same as DK-FR
DK	SI	AT-DK +1 OBU
DK	ES	Same as DK-FR
FR	IT	30% penetration in IT
FR	LU	Only the French OBU
FR	NL	Same as FR-BE
FR	PL	15% of penetration in PL brings PL-FR interoperability
FR	PT	Most ETS providers operating in France offer interop in PT, which is not reciprocal. The Country crossed is Spain, which is interoperable with both.
FR	SI	FR-IT +1 OBU

Origin	Destination	Assumptions
FR	ES	Most ETS providers operating in France and Spain offer interoperability between the 2 countries
FR	SE	Same as DK
DE	IT	AT-IT +1 OBU
DE	LU	Only the German OBU
DE	NL	Only the German OBU
DE	PT	Same as DE-FR
DE	ES	Same as DE-FR
DE	SE	Same as DK
IT	LU	Average of IT-FR and IT-DE
IT	NL	IT-BE or IT-DE
IT	PL	PL-AT +0.7 OBUs (30% penetration rate in IT)
IT	PT	Same as IT-FR
IT	ES	Same as IT-FR
IT	SE	Same as DK
LU	NL	Only 1 OBU needed: either the German one or the Belgian one
LU	PL	Same as PL-DE
LU	ES	Same as ES-FR
NL	PL	Same as PL-DE
NL	PT	Same as PT-BE
NL	SI	Same as SI-DE
NL	ES	Same as ES-BE
NL	SE	Same as DK

Origin	Destination	Assumptions
PL	PT	Same as FR-PL
PL	ES	Same as FR-PL
PL	SE	Same as DK
PT	ES	80% of the Spanish network is interoperable (the remaining 20% hardly impacted by binational transport). And many ETS providers operating in Spain offer interop with Portugal
SI	ES	Same as FR-SI
SI	SE	Same as DK
ES	SE	Same as DK

No charging schemes for HDVs in:	
Finland	FI
United Kingdom	UK
Cyprus	CY
Estonia	EE
Malta	MT
Albania	AL
Bosnia Herzegovina	BA
Montenegro	ME
Kosovo	XK

1.1.4 Split of EETS vs. national OBUs per country through time

Table 1-10: Split of EETS vs. national OBUs per country through time

Country	2016		2020		2025		Comments
	EETS OBU	National OBU	EETS OBU	National OBU	EETS OBU	National OBU	
Austria	0%	100%	30%	70%	50%	50%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
Belgium	14%	86%	30%	70%	40%	60%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
Bulgaria	0%	100%	0%	100%	0%	100%	No evidence that the country will open to EETS by 2025 in the current legislation framework
Croatia	0%	100%	0%	100%	0%	100%	No evidence that the country will open to EETS by 2025 in the current legislation framework
Czech Republic	0%	100%	0%	100%	0%	100%	No evidence that the country will open to EETS by 2025 in the current legislation framework
Denmark	10%	90%	30%	70%	50%	50%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
France	100%	0%	100%	0%	100%	0%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
Germany	0%	100%	0%	100%	0%	100%	No evidence that the country will open to EETS by 2025 in the current legislation framework
Greece	0%	100%	0%	100%	0%	100%	No evidence that the country will open to EETS by 2025 in the current legislation framework
Hungary	0%	100%	0%	100%	0%	100%	No evidence that the country will open to EETS by 2025 in the current legislation framework
Ireland	0%	100%	0%	100%	0%	100%	No evidence that the country will open to EETS by 2025 in the current legislation framework
Italy	5%	95%	20%	80%	30%	70%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
Poland	5%	95%	10%	90%	15%	85%	Already opened to EETS on limited network. We assume this share will slightly grow
Portugal	100%	0%	100%	0%	100%	0%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
Slovak Republic	0%	100%	0%	100%	0%	100%	No evidence that the country will open to EETS by 2025 in the current legislation framework

Country	2016		2020		2025		Comments
	EETS OBU	National OBU	EETS OBU	National OBU	EETS OBU	National OBU	
Slovenia	0%	100%	0%	100%	0%	100%	No evidence that the country will open to EETS by 2025 in the current legislation framework
Spain	100%	0%	100%	0%	100%	0%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
Sweden	10%	90%	30%	70%	40%	60%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers

1.1.5 Task 1.3 toll charger EU-level cost analysis

Table 1-11: Full summary of impact on EU-level operation costs of electronic tolling systems

Region	Country	Electronic Toll System	Business Model Used	NOMINAL CASE	WITH EETS	WITH SYSTEM SHARING	Notes
				Yearly Operation Costs	Yearly Operation Costs	Yearly Operation Costs	
EU (28)	Austria	Nationwide DSRC Free-Flow	DSRC with Mandatory OBU	€ 23,437,768	€ 23,243,890	€ 20,243,890	LKW-Maut
	Belgium (1)	Nationwide GNSS Free-Flow	GNSS with Mandatory OBU	€ 30,003,908	€ 26,912,708	€ 23,912,708	KCS VIAPASS
	Belgium (2)	Toll Plaza DSRC	DSRC with Alternative Means	€ 3,625,500	€ 3,623,010	€ 3,248,010	Liefkenshoek Tunnel
	Bulgaria	No Tolling System in Operation					
	Croatia	Toll Plaza DSRC	DSRC with Alternative Means	€ 7,794,523	€ 7,787,968	€ 6,287,968	
	Cyprus	No Tolling System in Operation					
	Czech Republic	Nationwide DSRC Free-Flow	DSRC with Mandatory OBU	€ 21,211,608	€ 21,520,608	€ 18,520,608	MYTO

	Denmark	Toll Plaza DSRC	DSRC with Alternative Means	€ 7,251,000	€ 7,246,020	€ 6,871,020	Storebaelt & Oeresund Bridges
	Estonia	No Tolling System in Operation					
	Finland	No Tolling System in Operation					
	France	Toll Plaza DSRC	DSRC with Alternative Means	€ 16,862,920	€ 16,862,920	€ 12,362,920	TIS_PL
	Germany	Nationwide GNSS Free-Flow	GNSS with Manual Booking	€ 351,000,000	€ 323,500,000	€ 323,500,000	LKW-Maut
	Greece	Toll Plaza DSRC	DSRC with Alternative Means	€ 5,188,240	€ 5,181,940	€ 2,931,940	
	Hungary	Nationwide GNSS Free-Flow	GNSS with Manual Booking	€ 42,500,000	€ 42,500,000	€ 37,500,000	
	Ireland (1)	Toll Plaza DSRC	DSRC with Alternative Means	€ 4,622,800	€ 4,622,800	€ 1,622,800	
	Ireland (2)	Regional DSRC Free-Flow	DSRC with Video Tolling	€ 10,447,750	€ 10,447,750	€ 9,322,750	
	Italy (1)	Toll Plaza DSRC	DSRC with Alternative Means	€ 19,314,920	€ 19,272,920	€ 17,772,920	TELEPASS
	Italy (2)	Regional DSRC Free-Flow	DSRC with Video Tolling	€ 3,500,000	€ 3,500,000	€ 3,200,000	Pedemontana Lombarda
	Latvia	No Tolling System in Operation					
	Lithuania	No Tolling System in Operation					
	Luxembourg	No Tolling System in Operation					
	Malta	No Tolling System in Operation					
	Netherlands	Toll Plaza DSRC	DSRC with Alternative Means	€ 3,625,500	€ 3,623,010	€ 3,248,010	Westerscheldetunnel

	Poland	Nationwide DSRC Free-Flow	DSRC with Mandatory OBU	€ 22,441,872	€ 22,981,872	€ 19,981,872	viaTOLL
	Portugal (1)	Toll Plaza DSRC	DSRC with Alternative Means	€ 16,627,120	€ 16,587,120	€ 11,337,120	VIA VERDE
	Portugal (2)	Regional DSRC Free-Flow	DSRC with Video Tolling	€ 5,000,000	€ 4,900,000	€ 4,000,000	Ascendi Portagem
	Romania	No Tolling System in Operation					
	Slovakia	Nationwide GNSS Free-Flow	GNSS with Mandatory OBU	€ 30,000,000	€ 25,000,000	€ 20,000,000	e-MYTO
	Slovenia	Nationwide DSRC Free-Flow	DSRC with Mandatory OBU	€ 9,970,551	€ 9,970,551	€ 3,489,693	
	Spain	Toll Plaza DSRC	DSRC with Alternative Means	€ 23,475,400	€ 23,475,400	€ 16,725,400	VIA-T
	Sweden	No Tolling System in Operation					
	United Kingdom (1)	Toll Plaza DSRC	DSRC with Alternative Means	€ 14,502,000	€ 14,492,040	€ 12,992,040	
	United Kingdom (2)	Regional DSRC Free-Flow	DSRC with Video Tolling	€ 10,447,750	€ 10,447,750	€ 9,322,750	Dartford Crossing

TOTAL		€ 682,851,130	€ 647,700,278	€ 588,394,420
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PERCENTAGE		5.15%	13.83%
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1.2 Task 1.8: Detailed analysis of accreditation procedures in different EU Member States

1.2.1 TIS-PL in France

The TIS-PL scheme has been established to replace the Caplis smart card system and to be as compliant as possible to the existing TIS-VL (Light Vehicles) scheme, Liber-T.

Becoming a new TIS-PL accredited issuer can be achieved within 18 to 24 months and implies:

- Use of a certified OBU in tolling lanes, e.g. works as specified by ASFA and works in all type of tolling lanes built by the SCAs (Sociétés Concessionnaire d'Autoroutes – French Concessionaires)
- Operation of a billing / reporting system which works as specified by ASFA and all SCAs
- Signature of contracts with each and every SCA (19 in total)

In terms of the main steps, the EETS applicant for TIS-PL accreditation will have to fulfill the following steps (the steps are performed one after the other):

Step#1:

- Dossier of certification to be submitted to all the SCA which will deliver a pre-certification agreement / 3 months

Step#2:

- Interface with the technical platform of the SCA / 1 month
- VABF (“Verification au bon fonctionnement”) equivalent to End-to-End tests with 19 toll domains / 6 months
- Signature of the contract with the 19 SCA

Step#3

- VSR (Verification en Service Régulier) : it's a real-life test of proper functioning in a real-world environment. The EETS provider will have around 2,000 OBUs that circulate on all the tolled network for approximately 3 months

Step#4

- The EETS provider becomes an accredited TIS-PL issuer

Step#5

- The EETS provider may request a complementary GNSS accreditation for an OBU which has been TIS certified (9 to 12 months procedure)

From a technical perspective, the ASFA documentation is stable and must be taken into account in the early stages of the EETS provider tolling solution design. The EETS provider will have to proceed in several steps before starting its operations with their own OBUs:

- Start the TIS-PL accreditation process with a TIS certified DSRC OBU¹
- In parallel, start the TIS certification of its OBU (certification led by the OBU manufacturer in case the OBU manufacturer has not done it previously)
- Ask for a complementary accreditation for the GNSS OBU as soon as the EETS Provider is accredited as TIS-PL issuer

As for the different DSRC toll domains, the EETS provider will have to be certified through the following process:

¹ The OBE Tis certification is dedicated process to check that OBE can interface with all the toll gates ETC system of the French 23 toll domains. The process last around 10 to 12 months and is performed by the OEM with ASFA. As soon as an OBE is TIS-certified then a TIS-PL accredited EETS provider can ask a complementary accreditation with this OBE.

- OBU certification (executed by ASFA on behalf of the SCA) according to the TC 278 CEN standard plus specifications missing in the standards (behaviour, communication zone, performances) for a given Equipment Class
- OBU configuration (executed by the Manufacturers) according to the specifications of the EETS provider, depending on their needs (taking into account their need to operate in one or more toll domains)
- OBU personalisation (executed by the EETS providers) according to the needs of the users (Customers/Vehicles)
- Operational verification of the interface between OBUs and RSEs
- Conformity of a TIS certified model of an OBU, once personalized, as delivered by the EETS provider: Verification by the Commission de Télépéage (in laboratory)
- Set of 'representative OBU' made available to the toll chargers via the Commission de Télépéage, for a verification by each toll charger of its RSEs/central system
- Functional and operational verification, end-to-end, for any new combination of OBU Model and EFC Context Mark, on a bilateral basis (EETS provider / toll charger), concluded by the Commission de Télépéage (requires unanimous approval of all SCA)

1.2.2 TELEPASS in Italy

An electronic toll collection service (referred to as Telepass) was launched in Italy in the early 1990's by Autostrade S.p.A., the main concessionaire, and then gradually extended to the entire national toll motorway network.

The toll motorway network has been organized into 27 different toll domains, operated by 27 different toll chargers, most of which (all except the tunnels under the Alps) support electronic toll collection.

The service is offered for all categories of vehicles; Telepass S.p.A. is the only service provider issuing OBUs for electronic toll collection from all vehicle types. However, an interoperable service, reserved for service providers offering toll payment services to heavy good vehicles only, was established in Italy between 2010 and 2011 – named SET-MP. The service is open to any service provider that can comply with the toll charger's requirements.

The service is rendered by means of the technology included in the Decision 2009/750/EU, i.e. in compliance with the European standard ETSI 200674-1; all the Italian toll chargers updated their roadside equipment to be compliant with the ETSI standard, and therefore to the EETS Decision, which goes above and beyond the national Uni standard upon which the service is currently provided by Telepass S.p.A.; the latter is not in use for the SET-MP service, it will remain in use only for the 'legacy' national service rendered by Telepass S.p.A.

Access to the SET-MP service is organized through AISCAT (the association of Italian toll motorway concessionaires) and AISCAT Servizi which has been given authority to clear the first phases of the accreditation procedure on behalf of all current Italian toll chargers.

AISCAT and AISCAT Servizi, on behalf of all the different toll chargers, have developed and set up a detailed accreditation and certification process through which they can process and validate the requests coming from any potential EETS Provider before allowing service provision to end users.

The process involves four main steps:

- Phase 0: Compliance Verification / 3 months
- Phase 1: Suitability for Use (SfU) – Test site verification / 2 months
- Phase 2: Suitability for Use (SfU) – Verification on real tolling facilities (VCCF) / 3 months
- Phase 3: Suitability for Use (SfU) – Operational test with real users (VRS) / 3 months

Besides Phase 2 and Phase 3, whose maximum duration (in case of successful operation) is indicated by AISCAT itself, the duration of the other two phases are for the moment estimated based on knowledge of the process and of the starting point. The specific activities within the different phases are detailed below.

1.2.2.1 Phase 0: Compliance Verification

Once the Service Provider has formally made the request for accreditation to AISCAT and signed a Confidentiality Agreement with AISCAT Servizi, the Service Provider or its supplier shall proceed to

perform laboratory and field tests with the relevant OBU in order to prove its compliance to specifications. Two different verifications are foreseen as part of this phase:

- Verification of compliance to the requirements of the 1999/5/EC Directive (R&TTE) and 2014/53/EU. The verification can be performed by means of a specific laboratory that is accredited in Italy for such purposes, or via another accredited laboratory at European level on behalf of the technology supplier.
- Verification of compliance to the specifications of the ETSI ES 200674-1 standard, with regards to the layer 1, 2 and 7 of the protocol. The verification requires the availability of a specific test suite (referred to as Test Suite RSE) that is able to simulate a roadside unit in a laboratory, in order to carry out tests that are required by the ETSI ES 200674-1 standard. In order to certify an OBU in the Italian domain, it is necessary to perform tests by using the specific Application Programming Interface (API) that are used by the different concessionaires, therefore it is recommended to use only one laboratory that already uses Test Suite RSE.

Two accredited laboratories already exist in Italy, namely the companies IMQ S.p.A. and Prima Ricerca & Sviluppo s.r.l.

As a result of such activities, the Service Provider will provide AISCAT Servizi with the CE Declaration of Conformity and with a certification of compliance to the ETSI ES 200674-1 standard for the OBU(s) that is intended to be used for the specific service. The delivery of these documents to AISCAT Servizi triggers the start of Phase 1 of the process.

1.2.2.2 Phase 1: Suitability for Use (SfU) – Test site verification

This phase constitutes the first part of the Suitability for Use testing. During this phase AISCAT Servizi – once the Phase 0 documentation has been delivered by the Service Provider and approved – reserves the right to perform any test that it considers necessary in order to validate the functioning of the OBU(s) with the roadside equipment.

In particular, AISCAT Servizi will generally:

- Conduct tests that have not been performed during Phase 0
- Repeat tests that have been already performed during Phase 0 to validate the correct implementation of the relevant Application Programming Interface
- Conduct stress test to validate the reliability of the OBU.

In this phase, there is a requirement to repeat in a laboratory environment certain stress tests that are considered particularly important (e.g. tests for specific thermal shock conditions). In order to conduct such kinds of tests, a laboratory equipped with an agreed test bench (such as the Test Suite RSE), supporting the common Application Programming Interface, is recommended. The test would normally be conducted with all the different types of roadside equipment that are typically installed in Italy (there is a limited number of lane systems suppliers in Italy, and even fewer suppliers of DSRC beacons) rather than using the test suite that has been commonly approved by all concessionaires.

In this phase, verifications aimed at validating the robustness and reliability of the OBU ensure a significant simplification of the following test Phases 2 and 3 (for example in terms of number of OBUs to be provided).

Finally, AISCAT Servizi will also conduct field tests, in both single lane and multilane free-flow environments, by using on one or more test sites with different roadside equipment configurations, that are representative of reality in the different toll domains.

The OBU under examination will be installed in real vehicles and AISCAT Servizi will conduct communication tests with the different type of front end (DSRC Beacons and lane system). No end to end tests will be performed yet in this phase. Specific tests in unconventional conditions (such as shadowing conditions, improper OBU installation, etc.) will also be performed.

The Service Provider will provide AISCAT Servizi with samples of the OBU(s) that are intended to be used for the purpose of providing the SET-MP service to its customers.

There is no specific time limit defined for the duration of this phase and no other Service Provider has ever conducted such tests. We assume at this stage that Phase 1 will not last more than a month.

1.2.2.3 Phase 2: Suitability for Use (SfU) – Verification on real tolling facilities (VCCF)

Once the OBU has successfully passed the first phase of the Suitability for Use test, the Service Provider will enter into a more direct relationship with all the different concessionaires. During this phase, referred to as VCCF (“Verifica della Conformità Corretto Funzionamento”), the following activities will have to be carried out:

- The Service Provider starts negotiations with each of the 27 toll domain concessionaires (toll chargers), to agree in particular on the conditions that are specific to each concessionaire (for example the level of commissions to be paid to the Service provider), and then the signing of relevant contracts;
- The toll chargers perform a verification of the correct functioning of the OBUs in an operational environment, in particular by using their own vehicles and their own lane systems and configuration, in end-to-end mode.

AISCAT Servizi and the Service Provider will agree, on the basis of the results of the previous verifications, on a number of OBUs to be made available to the different concessionaires for this phase. About 1,000 OBUs is a typical number that could be expected to be delivered.

Each one of the concessionaires will perform tests with OBUs in a real operational environment, by using their lane systems and configuration but without the involvement of real users. The concessionaires may then validate the correct end to end functioning of the OBUs within their respective environments.

This is also the phase where the first verification of the correct functioning of the back-office interfaces (along with the ISO 12855 standard and other applicable service level agreements) is conducted.

AISCAT Servizi is currently finalizing the relevant proforma Implementation Conformance Statement (ICS) in that regards, this document is planned to be released before summer 2017.

It is important in that respect to outline that the different concessionaires in Italy make use of three main processing centres as far as the transaction management is concerned, but in many cases a direct interface to the back-office of each concessionaire may be necessary (toll transactions are collected by one of these three processing centres providing services to the concessionaires, many concessionaires still maintain an active role in the exchange of data and of trust objects with the Service Provider). A case by case analysis will have to be performed once the testing in Phase 2 has begun.

This phase, as far as the field verification is concerned, is foreseen to last for up to 3 months. At the end of this phase, the different concessionaires confirm the correct performance of the tests and allow for the start of the following and final phase.

1.2.2.4 Phase 3: Suitability for Use (SfU) – Operational test with real users (VRS)

This is the very last phase of the accreditation and certification process, and the last part of the Suitability for Use test. The start of this phase requires the correct conclusion of the previous VCCF phase as well as the signature of the agreement between the Service Provider and each one of the toll chargers.

During this phase, referred to as VRS (“Verifica di Regolare Servizio”), the Service Provider is required to involve its own customers (between 5,000 and 10,000 customers) and equip them with real OBUs.

These customers will be using the OBU along the whole Italian toll motorway network for a period of up to 6 months, during which a verification of the correct end-to-end operation will be conducted.

This is a real pilot, where the relationship between the Service Provider and the different toll chargers are regulated by the normal contractual conditions (including any applicable KPI and SLA).

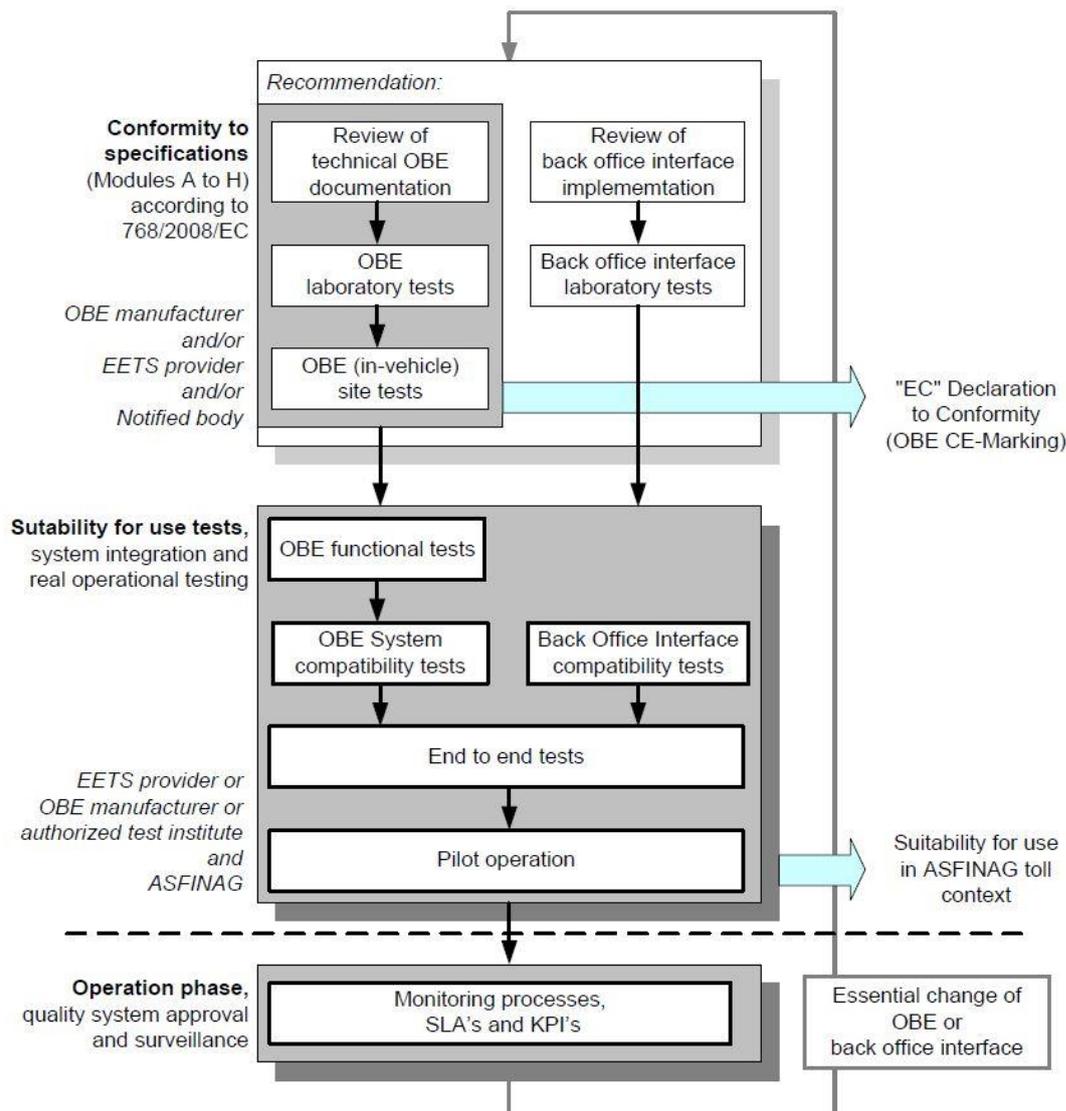
In the case of a successful conclusion of this phase, AISCAT will allow the launch of the full service.

1.2.3 Asfinag in Austria

The Austrian toll domain was recently opened to EETS Provider and several of them should be accredited in early 2017. The documentation is mostly in English which facilitates the exchange of information with applicants.

In Austria, the EETS acceptance procedures are divided into three main phases, as shown in the diagram below:

Figure 1-1: Overall description of EETS acceptance process in Austria



The main phases of the tests are described in more detail below:

The conformity to specification declaration

- Conformity to specification declaration for OBUs:
 - CE marking and declaration of conformity to specifications
 - OBU manufacturer examination certificates and reports
 - Test reports:
 - OBU tests defined in EN 15876-1 [IAP TEST] for all layers
 - A set of tests comparable to the functional tests defined in chapter 5.2 of the acceptance procedures document.
 - Additional tests
- Back office interface conformity declaration

The suitability for use tests

- Functional OBU tests
- Precondition for starting the functional OBU tests is the accepted conformity declaration for this OBU.

-
- Laboratory test cases
 - Test cases performed at the test site
 - OBU system compatibility tests
 - Test cases performed at the test site
 - On-road test cases
 - Back office interface compatibility tests. Precondition for starting the back-office interface compatibility tests is the accepted conformity declaration for this interface.
 - End to end tests. Precondition for starting the end to end tests is successful functional OBU and back office interface compatibility tests.
 - OBU pilot operation. Precondition for starting the pilot operation are successful end-to-end tests and settlement of all necessary commercial items.
 - Maximum number of vehicles / OBU: 500
 - Minimum duration of pilot operation: 2 months
 - Minimum required number of performed DSRC transactions during the pilot operation: 100,000

These test steps shall be performed in cooperation between ASFINAG and the EETS Provider or OBU manufacturer or in cooperation between ASFINAG and an authorized representative test institute. However, the responsibility for the test phase remains with the EETS Provider.

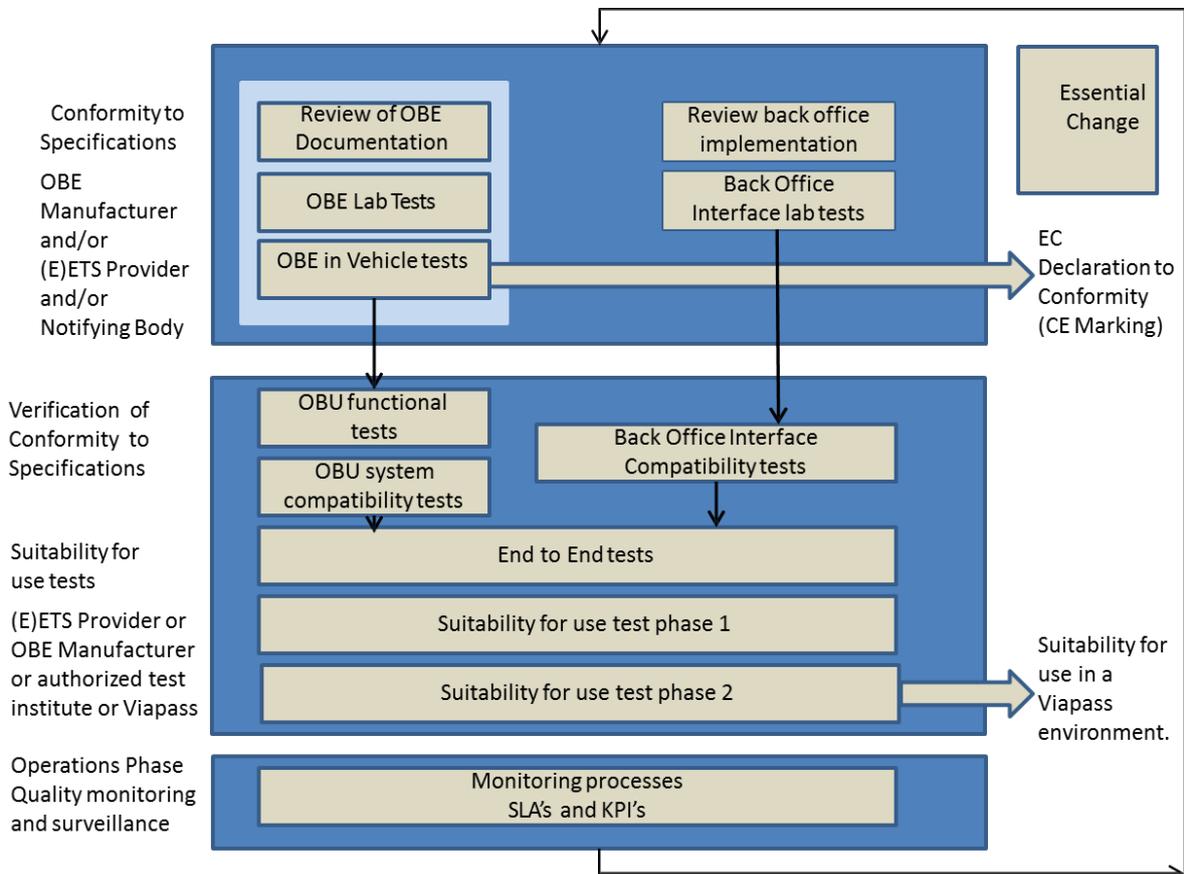
Monitoring during the operation phase

- Any OBU software or hardware change reports are the basis for the decision concerning which phases and steps of the approval process shall be repeated for the re-certification of the OBU.
- A major change to an OBU will result in the certification process defined for a new OBU type.
- A change of the back-office interface is only possible after agreement with ASFINAG.
- It is expected, that the manufacturer should perform a basic set of DSRC tests after each OBU software change, also in case of only a small software change without the necessity of a re-certification. A description of these tests shall be delivered to ASFINAG prior to the performance of the first "suitability for use" tests.

1.2.4 Viapass in Belgium

The requirements are available online and the accreditation process is clearly defined by Viapass. Compared to other toll charger, Viapass has defined limited guidance. The documentation is available in French and Flemish. The two main documents available are included below.

Requirement text	Version
Customer Finance Service Files Viapass and Regions	V5.1 8 Sept 2016
EETS back-office communication between Toll Charger and EETS service providers	V 18-Feb-2016
DSRC Interface Version 1.1 - Last revised 30-08-2016	V1.1 30 Aug 2016
Scheme Design Rules V3.1	V3.1
16 JUILLET 2015. - DÉCRET instaurant un prélèvement kilométrique à charge des poids lourds pour l'utilisation des routes (M.B. du 28/07/2015, p. 47827)	V 16 Juil 2015
AUTORITE FLAMANDE [C – 2015/35995] 3 JUILLET 2015. — Décret introduisant le prélèvement kilométrique et annulant le prélèvement de l'Eurovignette et modifiant le Code flamand de la Fiscalité du 13 décembre 2013 en la matière (1)	V 3 Juil 2015
29 JUILLET 2015. - Ordonnance introduisant un prélèvement kilométrique en Région de Bruxelles-Capitale sur les poids lourds prévus ou utilisés pour le transport par route de marchandises, en remplacement de l'Eurovignette	V 29 Juil 2015
Traffic Monitor – Traffic Analysis Center Interface Specification for EETS providers	V 25 Nov 2015
DÉCLARATION DU SECTEUR À PÉAGE DE LA SOFICO / Version 0.1. Date de publication 19.02.2016	V0.1 26 Feb 2016
DÉCLARATION DU SECTEUR À PÉAGE DE LA RÉGION FLAMANDE Version 0.1. Date de publication 26.02.2016	
DÉCLARATION DU SECTEUR À PÉAGE DE LA RÉGION DE BRUXELLES-CAPITALE Version 0.1. Date de publication 26.02.2016	
ANNEXE 4 : PROCÉDURE DE TESTS DESTINÉE AUX CANDIDATS PRESTATAIRES DE SERVICES Version 0.1. Date de publication 26.02.2016	V0.1 26 Feb 2016
ANNEXE 7: TECHNOLOGIE APPLICABLE, EXIGENCES TECHNIQUES ET KEY PERFORMANCE INDICATORS Version 0.1. Date de publication 26.02.2016	V0.1 26 Feb 2016
ANNEXE 8: LA MESURE DES KPI ET DES BONUS/MALUS Version 0.1. Date de publication 26.02.2016	V0.1 26 Feb 2016
ANNEXE 9: CATÉGORIES D'ÉVÈNEMENTS AVEC POINTS DE PÉNALITÉ Version 0.1. Date de publication 26.02.2016	V0.1 26 Feb 2016
ANNEXE 10: DROITS DE PROPRIÉTÉ INTELLECTUELLE Version 0.1. Date de publication 26.02.2017	V0.1 26 Feb 2017



For a registered EETS provider, the main steps are:

- OBU certification
- Conformity tests
- Suitability for use tests
 - Functional tests
 - OBU Compatibility
 - DSRC tests (enforcement part)
 - Back office interface tests
 - End-to-End tests
 - Tests according to Viapass scenarios, tests Phase 1. and Phase 2.
 - KPI measurement

The overall process is expected to last a minimum of 6 months.

1.2.5 LKW-Maut in Germany

The accreditation process in Germany is still not yet well defined. BMVI-BAG frequently updates its documentation and many aspects remain unclear (e.g. the future remuneration of EETS Providers, the contractual conditions and the KPIs that EETS providers will have to meet). Nevertheless several EETS providers have applied for the certification, in order to be able to start operations on the 1st of September 2018 when the new Toll Collect scheme will be fully implemented (the new 10 year operation contract starts then and the new shareholders will take over the shares).

The EETS accreditation procedure is governed by a contract (“Prüfvereinbarung”) including provisions on non-disclosure, data protection, data security, obligation to co-operate, costs. Some provisions are negotiable, including respites, schedule and timeframe of stages and procedure.

The procedure is described in Document A (Procedural Description) and B (Test Concept) which are available on the website of BMVI/BAG. The timeframe is approximately 13 months even if our estimation is around 18 months due to the number of tests to be performed and the number of kilometers to be driven on the tolled network. The language of procedure is German for both the documentation and the correspondence.

The BAG documents can be classified into the following groups:

1. A general introduction to the European Electronic Toll Service (EETS)-Domain BFStrMG
2. The description of the accreditation procedure and related appendices comprising in particular the acceptance test catalogue
3. The major requirements presented as a list of 53 items, each linked to a dedicated recommendation for documentation of the EETS solution
4. The EETS system technical specifications of the external interfaces (DSRC, ISO 12855, etc.)
5. The toll network definition
6. Miscellaneous

One positive point is that BMVI-BAG has defined in detail all the tests that the EETS provider will have to perform. This is very valuable because the applicant knows exactly what they have to do. Nevertheless the initial documentation requested by BMVI-BAG to demonstrate compliance of the EETS solution requires a significant effort due to the fact that it requires very detailed testing.

The main steps of the certification process are:

1.2.5.1 Step#1 – test block 1 / 6 months

- Checking preconditions
- Q/A sessions between BMVI-BAG and the EETS Provider
- Checking documentation provided by the EETS in accordance to BMVI-ABG guidance and program for validation

1.2.5.2 Step#2 – test block 2 / 7 months minimum

- Phase 1: Interface tests

- Phase 2: Trial operations
- Phase 3: Pilot operations

	Phase 1	Phase 2	Phase 3
Environment?	BAG: Test System EETS Provider: Toll System	BAG: close to live-operation Toll System in a controlled environment EETS Provider: Toll System	BAG: German Toll System EETS Provider: Toll System
Who?	EETS Provider test vehicles	EETS Provider test vehicles	Representative EETS User group
What?	Proof of primary functionality: <ul style="list-style-type: none"> - Data exchange - basic processes 	<ul style="list-style-type: none"> - Service usage on entire toll road network (test vehicles) - operational processes 	<ul style="list-style-type: none"> - Service usage under live operation conditions - operational processes
Where?	Predefined roads	Entire toll road network	100.000 km, 75% coverage

1.3 Key assumptions used in developing the policy scenarios

1.3.1 Cost assumptions for HDV OBUs

1.3.1.1 Policy option 1

Table 1-12: Cost assumption for HDV OBUs for policy option 1

	2016	2020	2025
Share of OBUs of Type 1 in the total OBU fleet	10%	20%	30%
Average yearly costs	109 €	113 €	110 €

1.3.1.2 Policy option 2

Table 1-13: Cost assumption for HDV OBUs for policy option 2

	2016	2020	2025
Share of OBUs of Type 1 in the total OBU fleet	10%	40%	60%
Average yearly costs	109 €	112 €	108 €

1.3.1.3 Policy option 3

Table 1-14: Cost assumption for HDV OBUs for policy option 3

	2016	2020	2025
Share of OBUs of Type 1 in the total OBU fleet	10%	40%	60%
Average yearly costs	109 €	112 €	101 €

1.3.1.4 EETS and national OBU cost variation through time

Note that the average cost in Table 1-15 is weighted by the share of each type of OBU, as included in the tables above.

Table 1-15: Combined table of policy option cost assumptions for HDV OBUs

Scenario	EETS OBU			National OBU			Average		
	2016	2020	2025	2016	2020	2025	2016	2020	2025
Baseline	147.23	147.23	147.23	104.32	104.32	104.32	108.61	110.76	112.05
Policy Option 1	147.23	147.23	123.23	104.32	104.32	104.32	108.61	113.00	110.00
Policy Option 2	147.23	123.23	111.23	104.32	104.32	104.32	108.61	111.89	108.47
Policy Option 3	147.23	123.23	99.23	104.32	104.32	104.32	108.61	111.89	101.27

1.3.2 Cost assumptions for private cars

The same cost assumptions for private cars as described for the baseline are used for each policy option, i.e. costs have been scaled in line with the HDV OBU costs..

1.3.3 Origin-destination pair OBU assumptions for each policy option

1.3.3.1 PO1 - 2016 number of OBUs required for each origin-destination pair

Table 1-16: Policy option 1 2016 number of OBUs required for each origin-destination pair

Country (load)	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	LI	NO	CH	AL	BA	MK	XK	ME	RS	BY	RU	TR	
Austria	AT		3/4/	3/4/		2	2,5/3,5			2/3/	1.50	5/6/	2		2	5	4	2		1.50	3/4/	3	2/3/	2	2	3	2,5/3,5	3/4/	1	4/5/	2	3/4/5/	3	4/5/	4/5/	3/4/	4	5/6/	3/5/6/		
Belgium	BE			5/7/	5/6/	3/4/	2/4/	5/6/	2/5/6/	1.86	2	5/7/9/	4/5/	2/3/	2/4/	5/6/	4/5/	1		1	3/4/	2/4/	4/5/	4/5/	4/5/	3	2/5/	1/2/	2/5/	4		5/6/		5/7/	5/7/	4/5/	5/6/	6/7/9/			
Bulgaria	BG				2/3/	2	4	6	5/8/	5/7/9/	3/5/6/	4/5/	1	2	6/7/	3/4/	5/8/	4/7/	4/5/6/	2	3/5/	5	4/7/8/	0	3	3	3/6/	5/7/8/	7	5/6/	7/8/	6/7/	2	2	2	2/3/	2	3/6/	2/3/	2	
Croatia	HR					4	5			4/5/	4	2/4/	2		2/3/					3	5		2	3	2				4	1/3/	1	2/3/	1/3/	1	2						
Cyprus	CY										3/7/	2															3/8/														
Czech Republic	CZ						3			3/4/	2	6/7/	3		3/4/	4	3	2		2	2	5	3	2	3	4/5/	3/4/	4/5/	4	3	4/5/	4	5/6/	5/6/	4/5/	3	4	4	4/6/		
Denmark	DK								1/2/5/	3/4/5/	2		5	2/3/6/	4	2/4/5/	2/4/	2		5	1/3/		5/6/	4		4/5/	2	1/5/	2/3/	3							4	2/5/	5/7/8/		
Estonia	EE							0	5/6/	4					6	1	2										1			2							2/3/	1	10		
Finland	FI									2/5/6/	1/3/4/		3/5/6/		5/6/	1	2			2/4/5/	1/3/					3/6/	1		2								2/3/	1	2/8/9/		
France	FR										2	3/7/8/	4/5/	2	1.95	5/6/	4/5/	1		1.86	3	1/2/	4	4/5/	3/4/	1	4/5/	1	3/4/5/	2		4/5/		4/5/	5/6/	4/5/	5/6/	4/5/	5/6/	3/7/8/	
Germany	DE											4/6/7/	3/4/	2/4/5/	3	4	3	1		1	2	4/5/	3/4/	3	3	3/4/	2/3/	2/3/4/	2	3	2	4/5/6/	4	5/6/	4/5/	4/5/	3	4	4/6/7/		
Greece	GR												4		2/6/			3/6/7/		4/6/	6/7/	4/9/	2			3/8/	8/9/10/	4/8/			1	1/2/3/	2	2	3			2			
Hungary	HU													5/6/	3	5/6/	4/5/	3/4/		3	3/4/	6	1	2	2	5/6/	4/5/6/	4/5/	6/7/	4	3/4/	2	3/4/	2/3/	2	4/5/	2/5/6/	4			
Ireland	IE														3/4/5/					1/3/	4/5/6/		5/6/8/			2/3/	1												5/8/9/		
Italy	IT															6	5	2.475		3/4/5/	4/5/	4	3/4/	3/4/	2	3	5	2/3/4/	2	5	2			2/5/	1/4/	2/4/		6/7/	2/6/		
Latvia	LV																2			5	3					4/6/7/	2	6/7/	3								2	2	10		
Lithuania	LT																			4	2			3		5/6/	2	5/6/	3	4							2	3	8		
Luxembourg	LU																			1	2					1		2/3/	3										5/7/8/		
Malta	MT																																								
Netherlands	NL																				2	2/4/	3	3	3	3	2	1/3/	2/4/	3/5/		5		5	5	4	3/5/	5/7/			
Poland	PL																				5/6/	3/4/	2	4/5/	4/5/	2/4/	3/4/5/	3/4/	3		4/5/	6	5/6/	5	2	3/4/	7/8/				
Portugal	PT																									1	1/4/	4											9		
Romania	RO																						2	2/3/	5/6/	4/5/6/	5/6/8/	6/7/	5	3					3	2		3			
Slovak Republic	SK																				3	5/6/	3/4/5/	4/5/			4/5/	4		3	4	4	4	3	3	4	5				
Slovenia	SI																									4/5/	5	4/5/	3	2/4/	2	4	3/4/	3	5	6	3/5/				
Spain	ES																										5/6/	1/2/	5/6/	3		5/7/	7	6	6	5/6/	6/7/	4/8/10/			
Sweden	SE																										1/6/	2	4								1/2/3/	6/9/			
United Kingdom	UK																												2									6/7/			
Liechtenstein	LI																												1												
Norway	NO																																								
Switzerland	CH																																								
Albania	AL																																								
Bosnia	BA																																								
Macedonia	MK																																							3	
Kosovo	XK																																							3	
Montenegro	ME																																								
Serbia	RS																																								
Belarus	BY																																							2	
Russia	RU																																								
Turkey	TR																																								

1.3.3.2 PO1 - 2020 number of OBUs required for each origin-destination pair

Table 1-17: Policy option 1 2020 number of OBUs required for each origin-destination pair

Country (load)	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	LI	NO	CH	AL	BA	MK	XK	ME	RS	BY	RU	TR			
Austria	AT	2.4	3/4/	2.7		2	2.4			1,6/2,5/	1.5	5/6/	2		1.8	5	4	1.5		1.5	2.9	1.8	2	2	1.7	1.8	2.4	3/4/	1	4/5/	2	3/4/5/	3	4/5/	4/5/	3/4/	4	5/6/	3/5/6/				
Belgium	BE		5/7/	4,1/4,3/		2.9	2.7	5/6/	2/5/6/	1.7	1.9	5/7/9/	3.4	2/2,7/	2.5	5/6/	4/5/	1		1	2.8	1.7	3.4	3.4	3.1	1.7	2.7	1/2/		2/5/	4	5/6/	5/7/	5/7/	4/5/	5/6/	6/7/9/						
Bulgaria	BG			2/3/	2	4	6	5/8/	5/7/9/	3/5/6/	4/5/	1	2	6/7/	3/4/	5/8/	4/7/	4/5/6/	2	3/5/	5	4/7/8/	0	3	3	3/6/	5/7/8/	7	5/6/	7/8/	6/7/	2	2	2/3/	2	3/6/	2/3/	2					
Croatia	HR					3.7	4.1			2,8/3,6/	3.2	2/4/	2		2/2,8/					3.2	5		2	3	2					4	1/3/	1	2/3/	1/3/	1	2							
Cyprus	CY									3/7/	2																3/8/																
Czech Republic	CZ						2.9			2,9/3,8/	2	6/7/	3		2,8/3,7/	4	3	2		2	2	2,9/4,5/	3	2	3	2,9/4,5/	2.9	4/5/		4	3	4/5/	4	5/6/	5/6/	4/5/	3	4	4/6/				
Denmark	DK							1/2/5/	2,8/3,4	1.9		3.4	2/3/6/	3	2/4/5/	2/4/	1.9			1.9	2.8	2,8/3,4/	5/6/	3.9	3.1	2,8/3,4/	1	1/5/		2/3/	3						4	2/5/	5/7/8/				
Estonia	EE							0	5/6/	4					6	1	2			5	1/3/						1											2/3/	1	10			
Finland	FI								2/5/6/	1/3/4/			3/5/6/		5/6/	1	2			2/4/5/	1/3/					3/6/	1											2/3/	1	2/8/9/			
France	FR									1.9	3/7/8/	2,6/3,5/	2	1.8	5/6/	4/5/	1		1.7	2.8	1	2,6/3,5/	2,6/3,5/	2.6	1	2,8/3,4	1		3/4/5/	2		4/5/	5/6/	5/6/	5/6/	4/5/	5/6/	4/5/	5/6/	3/7/8/			
Germany	DE									4/6/7/	2,5/4/	2/3,8/4,5/	2.7	4	3	1																								4/6/7/			
Greece	GR										4				2/6/			3/6/7/		4/6/	6/7/	4/9/	2			3/8/	8/9/10/	4/8/			1	1/2/3/	2	2		3			2				
Hungary	HU												5/6/	2.8	5/6/	4/5/	2.5			2.5	3/4/	3.6	1	2	2	3.6	3.4	4/5/		6/7/	4	3/4/	2	3/4/	2/3/		2	4/5/	2/5/6/	4			
Ireland	IE																			1/2,7/	3/4,8/5,5/					2		1												5/8/9/			
Italy	IT															6	5	2.3		2.7	3.7	1.8	2,8/4/	2.8	1.8	1.8	3	2/3/4/	2	5	2			2/5/	1/4/	2/4/		6/7/	2/6/				
Latvia	LV																			5	3					4/6/7/	2	6/7/		3							2	2	10				
Lithuania	LT																			4	2			3		5/6/	2	5/6/	3	4								2	3	8			
Luxembourg	LU																			1	1.9					1		2/3/			3									5/7/8/			
Malta	MT																																										
Netherlands	NL																				1.9	1.7	2,5/4/	3	2.2	1.7	1.9	1/3/		2/4/	3/5/		5		5		5	4	3/5/	5/7/			
Poland	PL																					2.8	3/4/	2	3,6/5/	2.8	2.8	3/4/5/		3/4/	3		4/5/	6	5/6/		5	2	3/4/	7/8/			
Portugal	PT																									1		1/4/													9		
Romania	RO																							2	2/3/	3,6/4,8/	5/6/	5/6/8/	6/7/	5	3				3		2				3		
Slovak Republic	SK																																										
Slovenia	SI																									2.6	3.1	4/5/		3	2/4/	2	4	3/4/	3	5	6	3	5	6	3/5/		
Spain	ES																										2,8/3,4/	1/2/		5/6/	3		5/7/	7	6		6	5/6/	6/7/	4/8/10/			
Sweden	SE																											1/6/	2	4										1/2/3/	6/9/		
United Kingdom	UK																																							6/7/			
Liechtenstein	LI																																										
Norway	NO																																										
Switzerland	CH																																										
Albania	AL																																										
Bosnia	BA																																										
Macedonia	MK																																										
Kosovo	XK																																										
Montenegro	ME																																										
Serbia	RS																																										
Belarus	BY																																										
Russia	RU																																										
Turkey	TR																																										

1.3.3.3 PO1 - 2025 number of OBUs required for each origin-destination pair

Table 1-18: Policy option 1 2025 number of OBUs required for each origin-destination pair

Country (load)	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	LI	NO	CH	AL	BA	MK	XK	ME	RS	BY	RU	TR	
Austria	AT	2.3	3/4/	2.5		2	2.3			1,5/2,4/	1.5	5/6/	2		1.6	5	4	1.5		1.5	2.8	1.7	2	2	1.5	1.7	2.3	3/4/	1	4/5/	2	3/4/5/	3	4/5/	4/5/	3/4/	4	5/6/	3/5/6/		
Belgium	BE		5/7/	3.8		2.8	2.6	5/6/	2/5/6/	1.5	1.8	5/7/9/	3.3	2/2,5/	2.1	5/6/	4/5/	1		1	2.6	1.5	3.3	3.3	2.8	1.5	2.6	1/2/		2/5/	4	5/6/		5/7/	5/7/	4/5/	5/6/	6/7/9/			
Bulgaria	BG			2/3/	2	4	6	5/8/	5/7/9/	3/5/6/	4/5/	1	2	6/7/	3/4/	5/8/	4/7/	4/5/6/	2	3/5/	5	4/7/8/	0	3	3	3/6/	5/7/8/	7	5/6/	7/8/	6/7/	2	2	2/3/	2	3/6/	2/3/	2			
Croatia	HR					3.5	3.8			2,6/3,2/	3	2/4/	2		2/2,6/					3	5		2	3	2					4	1/3/	1	2/3/	1/3/	1	2					
Cyprus	CY									3/7/	2																3/8/														
Czech Republic	CZ						2.8			2,8/3,7/	2	6/7/	3		2,6/3,4/	4	3	2		2	2	2,8/4/	3	2	3	2,8/4/	2.8	4/5/		4	3	4/5/	4	5/6/	5/6/	4/5/	3	4	4/6/		
Denmark	DK								1/2/5/	2,6/3,1/	1.8		3.3	2/3,5,5/	3	2/4/5/	2/4/	1.8		1.8	2.6	2,6/3,1/	5/6/	3.8	2.8	2,6/3,1/	1	1/5/		2/3/	3						4	2/5/	5/7/8/		
Estonia	EE							0	5/6/	4					6	1	2			5	1/3/						1			2							2/3/	1	10		
Finland	FI								2/5/6/	1/3/4/			3/5/6/		5/6/	1	2			2/4/5/	1/3/					3/6/	1		2								2/3/	1	2/8/9/		
France	FR									1.8	3/7/8/	2,6/3,5/	2	1.6	5/6/	4/5/	1		1.5	2.6	1	2,6/3,5/	2,5/3,4/	2.2	1	2,6/3,1/	1		3/4/5/	2		4/5/6/	4	5/6/	4/5/	5/6/	4/5/	5/6/	3/7/8/		
Germany	DE									4/6/7/	2,5/4/	2/3,5,4,2/	2.4	4	3	1		1	1.8	1.8	2,5/4/	3	2	1.8	1.8	2/3/4/	2	3	2	4/5/6/	4	5/6/	4/5/	4/5/	3	4	4/6/7/				
Greece	GR										4				2/6/			3/6/7/		4/6/	6/7/	4/9/	2			3/8/	8/9/10/	4/8/		1	1/2/3/	2	2	3				2			
Hungary	HU												5/6/	2.6	5/6/	4/5/	2.5		2.5	3/4/	3.2	1	2	2	3.2	3.3	4/5/		6/7/	4	3/4/	2	3/4/	2/3/	2	4/5/	2/5/6/	4			
Ireland	IE														2.6				1/2,5/	3/4,5/5,2/		5/6/8/				2	1											5/8/9/			
Italy	IT															6	5	2		2.4	3.4	1.6	2,6/4/	2.6	1.6	1.6	3	2/3/4/	2	5	2		2/5/	1/4/		2/4/		6/7/	2/6/		
Latvia	LV																			5	3					4/6/7/	2	6/7/		3						2	2	10			
Lithuania	LT																			4	2			3		5/6/	2	5/6/	3	4						2	3	8			
Luxembourg	LU																			1	1.8					1		2/3/											5/7/8/		
Malta	MT																																								
Netherlands	NL																				1.8	1.5	2,5/4/	3	2	1.5	1.8	1/3/		2/4/	3/5/		5		5	5	4	3/5/	5/7/		
Poland	PL																					2.6	3/4/	2	3,3/5/	2.6	2.6	3/4/5/		3/4/	3		4/5/	6	5/6/	5	2	3/4/	7/8/		
Portugal	PT																									1		1/4/		4									9		
Romania	RO																							2	2/3/	3,2/4,6/	5/6/	5/6/8/	6/7/	5	3			3	2				3		
Slovak Republic	SK																								2.5	2,5/3,4/	3.8	4/5/		4		3	4	4	3	3	4		5		
Slovenia	SI																									2.2	2.8	4/5/		3	2/4/	2	4	3/4/	3	5	6	3/5/			
Spain	ES																										2,6/3,1/	1/2/		5/6/	3	5/7/	7	6	6	5/6/	6/7/	4/8/10/			
Sweden	SE																											1/6/		2	4							1/2/3/	6/9/		
United Kingdom	UK																																					6/7/			
Liechtenstein	LI																																								
Norway	NO																																								
Switzerland	CH																																4/5/	6/7/	5/6/	5/6/	4				
Albania	AL																																	1	0	2					
Bosnia	BA																																	1/2/	1	1					
Macedonia	MK																																								
Kosovo	XK																																							3	
Montenegro	ME																																								
Serbia	RS																																								
Belarus	BY																																							2	
Russia	RU																																								3
Turkey	TR																																								

1.3.3.4 PO2 - 2016 number of OBUs required for each origin-destination pair

Table 1-19: Policy option 2 2016 number of OBUs required for each origin-destination pair

Country (load)	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	LI	NO	CH	AL	BA	MK	XK	ME	RS	BY	RU	TR	
Austria	AT		3/4/	3/4/	3/4/		2	2,5/3,5			2/3/	1.50	5/6/	2		2	5	4	2		1.50	3/4/	3	2/3/	2	2	3	2,5/3,5	3/4/	1	4/5/	2	3/4/5/	3	4/5/	4/5/	3/4/	4	5/6/	3/5/6/	
Belgium	BE			5/7/	5/6/		3/4/	2/4/	5/6/	2/5/6/	1.86	2	5/7/9/	4/5/	2/3/	2/4/	5/6/	4/5/	1		1	3/4/	2/4/	4/5/	4/5/	4/5/	3	2/5/	1/2/	2/5/	4		5/6/	5/7/	5/7/	4/5/	5/6/	6/7/9/			
Bulgaria	BG				2		4	6	5/8/	5/7/9/	3/5/6/	4/5/	1	2	6/7/	3/4/	5/8/	4/7/	4/5/6/	2	3/5/	5	4/7/8/	0	3	3	3/6/	5/7/8/	7	5/6/	7/8/	6/7/	2	2	2	2/3/	2	3/6/	2/3/	2	
Croatia	HR						4	5			4/5/	4	2/4/	2	2/3/						3	5		2	3	2				4	1/3/	1	2/3/	1/3/	1	2					
Cyprus	CY										3/7/	2																3/8/													
Czech Republic	CZ						3			3/4/	2	6/7/	3		3/4/	4	3	2			2	2	5	3	2	3	4/5/	3/4/	4/5/	4	3	4/5/	4	5/6/	5/6/	4/5/	3	4	4/6/		
Denmark	DK								1/2/5/	3/4/5/	2		5	2/3/6/	4	2/4/5/	2/4/	2			2	3	5/6/	5/6/	4		4/5/	2	1/5/	2/3/	3						4	2/5/	5/7/8/		
Estonia	EE							0	5/6/	4					6	1	2				5	1/3/					1		2								2/3/	1	10		
Finland	FI								2/5/6/	1/3/4/			3/5/6/		5/6/	1	2				2/4/5/	1/3/					3/6/	1	2								2/3/	1	2/8/9/		
France	FR									2	3/7/8/	4/5/	2	1.95	5/6/	4/5/	1			1.86	3	1/2/	4	4/5/	3/4/	1	4/5/	1	3/4/5/	2		4/5/		5/6/	5/6/	4/5/	5/6/	4/5/	5/6/	3/7/8/	
Germany	DE										4/6/7/	3/4/	2/4/5/	3	4	3	1			1	2	4/5/	3/4/	3	3	3/4/	2/3/	2/3/4/	2	3	2	4/5/6/	4	5/6/	4/5/	4/5/	3	4	4/6/7/		
Greece	GR											4		2/6/							4/6/	6/7/	4/9/	2			3/8/	8/9/10/	4/8/			1	1/2/3/	2	2	3			2		
Hungary	HU													5/6/	3	5/6/	4/5/	3/4/		3	3/4/	6	1	2	2	5/6/	4/5/6/	4/5/		6/7/	4	3/4/	2	3/4/	2/3/	2	4/5/	2/5/6/	4		
Ireland	IE														3/4/5/					1/3/	4/5/6/		5/6/8/			2/3/	1												5/8/9/		
Italy	IT															6	5	2.475			3/4/5/	4/5/	4	3/4/	3/4/	2	3	5	2/3/4/	2	5	2			2/5/	1/4/	2/4/		6/7/	2/6/	
Latvia	LV																2			5	3						4/6/7/	2	6/7/	3							2	2	10		
Lithuania	LT																			4	2			3			5/6/	2	5/6/	3	4						2	3	8		
Luxembourg	LU																			1	2						1	2/3/		3									5/7/8/		
Malta	MT																																								
Netherlands	NL																				2	2/4/	3	3	3	3	2	1/3/	2/4/	3/5/			5		5		5	4	3/5/	5/7/	
Poland	PL																				5/6/	3/4/	2	4/5/	4/5/	2/4/	3/4/5/	3/4/	3		4/5/	6	5/6/		5	2	3/4/	7/8/			
Portugal	PT																										1	1/4/	4										9		
Romania	RO																						2	2/3/	5/6/	4/5/6/	5/6/8/	6/7/	5	3					3	2		3			
Slovak Republic	SK																				3	5/6/	3/4/5/	4/5/				4			3	4	4	3	3	3	4	5			
Slovenia	SI																										4/5/	5	4/5/	3	2/4/	2	4	3/4/	3	5	6	3/5/			
Spain	ES																										5/6/	1/2/	5/6/	3		5/7/	7	6		6	5/6/	6/7/	4/8/10/		
Sweden	SE																											1/6/	2	4									1/2/3/	6/9/	
United Kingdom	UK																																						6/7/		
Liechtenstein	LI																													1											
Norway	NO																																								
Switzerland	CH																																4/5/	6/7/	5/6/	5/6/	4				
Albania	AL																																		1	0	2				
Bosnia	BA																																	1/2/	1	1					
Macedonia	MK																																							3	
Kosovo	XK																																							3	
Montenegro	ME																																								
Serbia	RS																																								
Belarus	BY																																								
Russia	RU																																								2
Turkey	TR																																								

1.3.3.5 PO2 - 2020 number of OBUs required for each origin-destination pair

Table 1-20: Policy option 2 2020 number of OBUs required for each origin-destination pair

Country (load)	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	LI	NO	CH	AL	BA	MK	XK	ME	RS	BY	RU	TR						
Austria	AT	2.10	2.9/3.9/	2.4		1.7	2.10			1.5/2.4/	1.40	4.5/5.5/	1.7		1.7	5	4	1.4		1.4	2.4	1.6	1.7	1.7	1.7	1.6	2.10	3/4/	1	4/5/	2	3/4/5/	3	4/5/	4/5/		3/4/	4	5/6/	3/5/6/						
Belgium	BE		4.5/6.5/	3.6		2.4	2.4	5/6/	2/5/6/	1.5	1.7	4.5/6.5/8.5/	2.8	1.9/2.5/	2.2	5/6/	4/5/	1		1	2.4	1.5	2.8	2.8	2.8	1.5	2.4	1/2/		2/5/	4	5/6/	5/7/	5/7/	4/5/	5/6/	6/7/9/									
Bulgaria	BG			2/3/	2	4	5.5	5/8/	5/7/9/	3/5/6/	4/5/	1	2	6/7/	3/4/	5/8/	4/7/	4/5/6/	2	3/5/	5	4/7/8/	0	3	3	3/6/	5/7/8/	7	5/6/	7/8/	6/7/	2	2	2/3/	2	3/6/	2/3/	2								
Croatia	HR					3.1	3.5			2.4/3.1/	2.8	2/4/	1.7		1.7/2.4/						2.8	4		2	2.4	1.7					4	1/3/	1	2/3/	1/3/	1	2									
Cyprus	CY									3/7/	2																	3/8/																		
Czech Republic	CZ						2.4			2.4/3.4/	1.7	5.5/6.5/	2.4		2.4/3.1/	4	3	1.7		1.7	1.7	2.4/3.8/	2.6	1.7	2.4	2.4/3.8/	2.4	4/5/	4	3	4/5/	4	5/6/	5/6/	4/5/	3	4	4/6/								
Denmark	DK								1/2/5/	2.4/2.9/	1.7		2.8	1.9/2.5/5/	2.80	2/4/5/	2/4/	1.7		1.7	2.4	2.4/2.9/	4.5/5.5/	3.1	2.8	2.4/2.9/	1	1/5/		2/3/	3						4	2/5/	5/7/8/							
Estonia	EE								0	5/6/	4				6	1	2			5	1/3/																		4	2/3/	1	10				
Finland	FI									2/5/6/	1/3/4/		3/5/6/		5/6/	1	2			2/4/5/	1/3/						3/6/	1											2/3/	1	2/8/9/					
France	FR									1.7	2.5/6/7/	2.2/3.1/	1.9	1.7	5/6/	4/5/	1		1.5	2.4	1	2.2/3.1/	2.2/3.1/	2.4	1	2.4/2.9/	1	1	3/4/5/	2		4/5/		5/6/	5/6/	5/6/	4/5/	5/6/	5/6/	3/7/8/						
Germany	DE										3.5/5.5/6.5/	2.1/3.1/	1.9/3/3.8/	2.4	4	3	1		1	1.7	1.7	2.1/3.1/	2.4	2.1	1.7	1.7	1.7	2/3/4/	2	3	2	4/5/6/	4	5/6/	4/5/	4/5/	3	4	4/6/7/							
Greece	GR										3.7				1.7/5.5/			2.5/5/6/		3.5/5.5/	5.5/6.5/	4/9/	2			2.5/7.5/	7.5/8.5/9.5/				1	1/2/3/	2	2		3						2				
Hungary	HU												4/5/	2.4	5/6/	4/5/	2.1		2.1	2.4/3.1/	3.1	1	1.7	1.7	3.1	2.8	4/5/		6/7/	4	3/4/	2	3/4/	2/3/	2	4/5/	2/5/6/	4								
Ireland	IE														2.6					1/2.5/	2.6/3.7/4.5/					1.9		1														5/8/9/				
Italy	IT															6	5	2		2.4	3.1	1.7	2.4/4/	2.4	1.7	1.7	3	2/3/4/	2	5	2			2/5/	1/4/	2/4/			6/7/	2/6/						
Latvia	LV																			5	3					4/6/7/	2	6/7/		3								2	2	10						
Lithuania	LT																			4	2			3		5/6/	2	5/6/	3	4								2	3	8						
Luxembourg	LU																			1	1.7					1		2/3/		3											5/7/8/					
Malta	MT																																													
Netherlands	NL																																													
Poland	PL																				1.7	1.5	2.1/3.1/	2.4	2.1	1.5	1.7	1/3/	2/4/	3/5/		5	5	5	4	3/5/	5/7/									
Portugal	PT																					2.4	2.4/3.1/	1.7	3.1/3.8/	2.4	2.4	3/4/5/	3/4/	3		4/5/	6	5/6/	5	2	3/4/	7/8/								
Romania	RO																									1	1/4/				4											9				
Slovak Republic	SK																						1.7	1.7/2.7/	3.1/4.7/	4.5/5.5/	5/6/8/	6/7/	5	3			3	2								3				
Slovenia	SI																																													
Spain	ES																																													
Sweden	SE																										2.4/2.9/	1/2/	5/6/	3	4		5/7/	7	6	6	5/6/	6/7/	4/8/10/							
United Kingdom	UK																											1/6/	2														6/7/			
Liechtenstein	LI																																													
Norway	NO																																													
Switzerland	CH																																													
Albania	AL																																4/5/	6/7/	5/6/	5/6/	4									
Bosnia	BA																																													
Macedonia	MK																																													
Kosovo	XK																																													
Montenegro	ME																																													
Serbia	RS																																													
Belarus	BY																																													
Russia	RU																																													
Turkey	TR																																													

1.3.3.6 PO2 - 2025 number of OBUs required for each origin-destination pair

Table 1-21: Policy option 2 2025 number of OBUs required for each origin-destination pair

Country (load)	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	LI	NO	CH	AL	BA	MK	XK	ME	RS	BY	RU	TR			
Austria	AT	1.70	2,6/3,6/	1.9		1.5	1.70			1,3/1,8/	1.30	4/5/	1.5		1.3	5	4	1.3		1.3	1.9	1.5	1.5	1.5	1.4	1.5	1.70	3/4/	1	4/5/	2	3/4/5/	3	4/5/	4/5/	3/4/	4	5/6/	3/5/6/				
Belgium	BE		4/6/	2.5		1.9	1.8	5/6/	2/5/6/	1.3	1.4	4/6/8/	2.2	1,7/2,3/	1.6	5/6/	4/5/	1		1	1.8	1.3	2.2	2.2	2.1	1.3	1.8	1/2/	2/5/	4	5/6/	2	2/3/	5/7/	5/7/	4/5/	4/5/	5/6/	6/7/9/				
Bulgaria	BG			2	2	3.5	5	5/8/	5/7/9/	3/4/5/	3/4/	1	1.5	5/6/	2/3/	5/8/	4/7/	3/4/5/	2	3/4/	4	3/6/7/	0	2	2	3/5/	5	7	5/6/	7/8/	6/7/	2	2	2/3/	2/3/	1	2	3/6/	2/3/	2			
Croatia	HR					2.4	2.6			1,8/2,1/	2.20	2/4/	1.5		1,5/1,8/					2.2	3		2	2	1.5					4	1/3/	1	2/3/	1/3/	1	2							
Cyprus	CY									3/7/	2																	3/8/															
Czech Republic	CZ						1.9			1,8/2,8/	1.5	5/6/	2		1,8/2,2/	4	3	1.5		1.5	1.5	1,8/2,5/	2.2	1.5	1.5	1,8/2,5/	1.9	4/5/		4	3	4/5/	4	5/6/	5/6/	4/5/	3	4	4/6/				
Denmark	DK							1/2/5/	1,8/2,1/	1.4		2.2	1,7/2,3/4,5/	2	2/4/5/	2/4/		1.4		1.4	1.8	1,8/2,1/	4/5/	2.4	2.1	1,8/2,1/	1	1/5/		2/3/	3						4	2/5/	5/7/8/				
Estonia	EE							0	5/6/	4					6	1	2			5	1/3/						1											2/3/	1	10			
Finland	FI								2/5/6/	1/3/4/			3/5/6/		5/6/	1	2			2/4/5/	1/3/						3/6/	1		2								2/3/	1	2/8/9/			
France	FR									1.4	2/5/6/	1,8/2,3/	1.7	1.3	5/6/	4/5/	1			1.3	1.8	1	1,8/2,3/	1,8/2,3/	1.7	1	1,8/2,1/	1		3/4/5/	2		4/5/		5/6/	5/6/	4/5/	5/6/	3/7/8/				
Germany	DE									3/5/6/	1,8/2,5/	1,7/2,8/3/	1.7		4	3	1			1	1.4	1.4	1,8/2,5/	2	1.7	1.4	1.4	2/3/4/	2	3	2	4/5/6/	4	5/6/	4/5/	4/5/	3	4	4/6/7/				
Greece	GR										3.5				1,5/5/			2,4,5/5,5/		3/5/	5/6/	3/8/	2			2/7/	7/8/9/	4/8/			1	1/2/3/	2	2	3			2					
Hungary	HU												3/4/	1.8	5/6/	4/5/		1.8		1.8	2/2,4/	2.1	1	1.5	1.5	2.1	2.2	4/5/		6/7/	4	3/4/	2	3/4/	2/3/	2	4/5/	2/5/6/	4				
Ireland	IE														2					1/2,3/	2,1/3,2/3,4/		3,5/4/5/			1.7		1											5/8/9/				
Italy	IT															6	5	1.5		1.7	2.2	1.3	1,8/4/	1.8	1.4	1.3	2	2/3/4/	2	5	2			2/5/	1/4/	2/4/			6/7/	2/6/			
Latvia	LV																			5	3					4/6/7/	2	6/7/										2	2	10			
Lithuania	LT																			4	2			3		5/6/	2	5/6/		3	4							2	3	8			
Luxembourg	LU																			1	1.4					1		2/3/			3									5/7/8/			
Malta	MT																																										
Netherlands	NL																				1.4		1.3	1,8/2,5/	2	1.7	1.3	1.4	1/3/		2/4/	3/5/		5		5	5	4	3/5/	5/7/			
Poland	PL																				1.8	2/2,4/	1.5	2,3/2,9/	1.8	1.8	3/4/5/		3/4/	3		4/5/	6	5/6/	5	2	3/4/	7/8/					
Portugal	PT																									1		1/4/			4									9			
Romania	RO																							1.5	1,5/2,5/	2,1/4,3/	4/5/	5/6/8/		6/7/	5	3				3	2			3			
Slovak Republic	SK																									1.9	1,8/2,3/	2.4	4/5/				3	4	4	4	3	3	4	5			
Slovenia	SI																									1.7	2.1	4/5/		3	2/4/	2	4	3/4/	3	5	6	3/5/					
Spain	ES																										1,8/2,1/	1/2/	5/6/	3		5/7/	7	6	6	5/6/	6/7/	4/8/10/					
Sweden	SE																											1/6/		2	4							1/2/3/	6/9/				
United Kingdom	UK																																						6/7/				
Liechtenstein	LI																																										
Norway	NO																																										
Switzerland	CH																																										
Albania	AL																																4/5/	6/7/	5/6/		5/6/	4					
Bosnia	BA																																										
Macedonia	MK																																										
Kosovo	XK																																										
Montenegro	ME																																										
Serbia	RS																																										
Belarus	BY																																										
Russia	RU																																										
Turkey	TR																																										

1.3.3.7 PO3 - 2016 number of OBUs required for each origin-destination pair

Table 1-22: Policy option 3 2016 number of OBUs required for each origin-destination pair

Country (load)	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	LI	NO	CH	AL	BA	MK	XK	ME	RS	BY	RU	TR
Austria	AT		3/4/	3/4/	3/4/		2	2,5/3,5		2/3/	1.50	5/6/	2		2	5	4	2		1.50	3/4/	3	2/3/	2	2	3	2,5/3,5	3/4/	1	4/5/	2	3/4/5/	3	4/5/	4/5/	3/4/	4	5/6/	3/5/6/	
Belgium	BE		5/7/	5/6/		3/4/	2/4/	5/6/	2/5/6/	1.86	2	5/7/9/	4/5/	2/3/	2/4/	5/6/	4/5/	1		1	3/4/	2/4/	4/5/	4/5/	4/5/	3	2/5/	1/2/	2/5/	4		5/6/	5/7/	5/7/	4/5/	5/6/	6/7/9/			
Bulgaria	BG			2/3/	2	4	6	5/8/	5/7/9/	3/5/6/	4/5/	1	2	6/7/	3/4/	5/8/	4/7/	4/5/6/	2	3/5/	5	4/7/8/	0	3	3	3/6/	5/7/8/	7	5/6/	7/8/	6/7/	2	2	2	2/3/	2	3/6/	2/3/	2	
Croatia	HR					4	5			4/5/	4	2/4/	2		2/3/					3	5		2	3	2				4	1/3/	1	2/3/	1/3/	1	2					
Cyprus	CY									3/7/	2																3/8/													
Czech Republic	CZ						3			3/4/	2	6/7/	3		3/4/	4	3	2		2	2	5	3	2	3	4/5/	3/4/	4/5/	4	3	4/5/	4	5/6/	5/6/	4/5/	3	4	4/6/		
Denmark	DK							1/2/5/	3/4/5/	2		5	2/3/6/	4	2/4/5/	2/4/	2			2	3	5/6/	5/6/	4		4/5/	2	1/5/	2/3/	3						4	2/5/	5/7/8/		
Estonia	EE							0	5/6/	4				6	1	2				5	1/3/						1		2								2/3/	1	10	
Finland	FI								2/5/6/	1/3/4/			3/5/6/		5/6/	1	2			2/4/5/	1/3/						3/6/	1	2								2/3/	1	2/8/9/	
France	FR									2	3/7/8/	4/5/	2	1.95	5/6/	4/5/	1		1.86	3	1/2/	4	4/5/	3/4/	1	4/5/	1		3/4/5/	2		4/5/		5/6/	5/6/	4/5/	5/6/	4/5/	5/6/	3/7/8/
Germany	DE										4/6/7/	3/4/	2/4/5/	3	4	3	1		1	2	4/5/	3/4/	3	3	3/4/	2/3/	2/3/4/	2	3	2	4/5/6/	4	5/6/	4/5/	4/5/	3	4	4/6/7/		
Greece	GR						2/6/								2/6/					3/6/7/	4/6/	6/7/	4/9/	2			3/8/	8/9/10/	4/8/			1	1/2/3/	2	2	3			2	
Hungary	HU													5/6/	3	5/6/	4/5/	3/4/		3	3/4/	6	1	2	2	5/6/	4/5/6/	4/5/		6/7/	4	3/4/	2	3/4/	2/3/	2	4/5/	2/5/6/	4	
Ireland	IE														3/4/5/					1/3/	4/5/6/		5/6/8/			2/3/		1											5/8/9/	
Italy	IT															6	5	2.475		3/4/5/	4/5/	4	3/4/	3/4/	2	3	5	2/3/4/	2	5	2			2/5/	1/4/	2/4/		6/7/	2/6/	
Latvia	LV																2			5	3					4/6/7/	2	6/7/	3								2	2	10	
Lithuania	LT																		4	2			3			5/6/	2	5/6/	3	4							2	3	8	
Luxembourg	LU																		1	2						1		2/3/		3									5/7/8/	
Malta	MT																																							
Netherlands	NL																			2	2/4/	3	3	3	3	3	2	1/3/	2/4/	3/5/		5		5		5	4	3/5/	5/7/	
Poland	PL																			5/6/	3/4/	2	4/5/	4/5/	2/4/	3/4/5/	3/4/	3	4/5/	6	5/6/	5/6/	5	2	3/4/	7/8/				
Portugal	PT																										1	1/4/	4										9	
Romania	RO																						2	2/3/	5/6/	4/5/6/	5/6/8/	6/7/	5	3					3	2		3		
Slovak Republic	SK																			3	5/6/	3/4/5/	4/5/					4			3	4	4	3	3	4	5			
Slovenia	SI																									4/5/	5	4/5/	3	2/4/	2	4	3/4/	3	5	6	3/5/			
Spain	ES																										5/6/	1/2/	5/6/	3		5/7/	7	6		6	5/6/	6/7/	4/8/10/	
Sweden	SE																											1/6/	2	4									1/2/3/	6/9/
United Kingdom	UK																												2									6/7/		
Liechtenstein	LI																												1											
Norway	NO																																							
Switzerland	CH																															4/5/	6/7/	5/6/	5/6/	4				
Albania	AL																																	1	0	2				
Bosnia	BA																																1/2/	1	1					
Macedonia	MK																																						3	
Kosovo	XK																																						3	
Montenegro	ME																																							
Serbia	RS																																							
Belarus	BY																																						2	
Russia	RU																																							
Turkey	TR																																							

1.3.3.8 PO3 – 2020 number of OBUs required for each origin-destination pair

Table 1-23: Policy option 3 2020 number of OBUs required for each origin-destination pair

Country (load)	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	LI	NO	CH	AL	BA	MK	XK	ME	RS	BY	RU	TR							
Austria	AT	2.10	2.9/3.9/	2.4		1.7	2.10			1.5/2.4/	1.40	4.5/5.5/	1.7		1.7	5	4	1.4		1.4	2.4	1.6	1.7	1.7	1.7	1.6	2.10	3/4/	1	4/5/	2	3/4/5/	3	4/5/	4/5/		3/4/	4	5/6/	3/5/6/							
Belgium	BE		4.5/6.5/	3.6		2.4	2.4	5/6/	2/5/6/	1.5	1.7	4.5/6.5/8.5/	2.8	1.9/2.5/	2.2	5/6/	4/5/	1		1	2.4	1.5	2.8	2.8	2.8	1.5	2.4	1/2/	2/5/	4		5/6/	5/7/	5/7/	4/5/	5/6/	5/6/	6/7/9/									
Bulgaria	BG			2/3/	2	4	5.5	5/8/	5/7/9/	3/5/6/	4/5/	1	2	6/7/	3/4/	5/8/	4/7/	4/5/6/	2	3/5/	5	4/7/8/	0	3	3	3/6/	5/7/8/	7	5/6/	7/8/	6/7/	2	2	2/3/	2	3/6/	2/3/	2									
Croatia	HR					3.1	3.5			2.4/3.1/	2.8	2/4/	1.7		1.7/2.4/					2.8	4		2	2.4	1.7					4	1/3/	1	2/3/	1/3/	1	2											
Cyprus	CY									3/7/	2																	3/8/																			
Czech Republic	CZ						2.4			2.4/3.4/	1.7	5.5/6.5/	2.4		2.4/3.1/	4	3	1.7		1.7	1.7	2.4/3.8/	2.6	1.7	2.4	2.4/3.8/	2.4	4/5/	4	3	4/5/	4	5/6/	5/6/	4/5/	3	4	4/6/									
Denmark	DK								1/2/5/	2.4/2.9/	1.7		2.8	1.9/2.5/5/	2.80	2/4/5/	2/4/	1.7		1.7	2.4	2.4/2.9/	4.5/5.5/	3.1	2.8	2.4/2.9/	1	1/5/	2/3/	3							4	2/5/	5/7/8/								
Estonia	EE								0	5/6/	4				6	1	2			5	1/3/																		4	2/3/	1	10					
Finland	FI									2/5/6/	1/3/4/		3/5/6/		5/6/	1	2			2/4/5/	1/3/					3/6/	1												2/3/	1	2/8/9/						
France	FR									1.7	2.5/6/7/	2.2/3.1/	1.9	1.7	5/6/	4/5/	1		1.5	2.4	1	2.2/3.1/	2.2/3.1/	2.4	1	2.4/2.9/	1	1	3/4/5/	2		4/5/		5/6/	5/6/	5/6/	4/5/	5/6/	5/6/	3/7/8/							
Germany	DE										3.5/5.5/6.5/	2.1/3.1/	1.9/3/3.8/	2.4	4	3	1		1	1.7	1.7	2.1/3.1/	2.4	2.1	1.7	1.7	1.7	2/3/4/	2	3	2	4/5/6/	4	5/6/	4/5/	4/5/	3	4	4/6/7/								
Greece	GR										3.7				1.7/5.5/			2.5/5/6/		3.5/5.5/	5.5/6.5/	4/9/	2			2.5/7.5/	7.5/8.5/9.5/				1	1/2/3/	2	2			3							2			
Hungary	HU												4/5/	2.4	5/6/	4/5/	2.1		2.1	2.4/3.1/	3.1	1	1.7	1.7	3.1	2.8	4/5/		6/7/	4	3/4/	2	3/4/	2/3/	2	4/5/	2/5/6/	4									
Ireland	IE														2.6					1/2.5/	2.6/3.7/4.5/			4/5/7/		1.9		1																5/8/9/			
Italy	IT															6	5	2		2.4	3.1	1.7	2.4/4/	2.4	1.7	1.7	3	2/3/4/	2	5	2			2/5/	1/4/	2/4/			6/7/	2/6/							
Latvia	LV																			5	3					4/6/7/	2	6/7/		3								2	2	10							
Lithuania	LT																			4	2			3		5/6/	2	5/6/	3	4								2	3	8							
Luxembourg	LU																			1	1.7					1		2/3/		3												5/7/8/					
Malta	MT																																														
Netherlands	NL																																														
Poland	PL																				1.7	1.5	2.1/3.1/	2.4	2.1	1.5	1.7	1/3/	2/4/	3/5/		5	5	5	4	3/5/	5/7/										
Portugal	PT																																													9	
Romania	RO																																														
Slovak Republic	SK																																														
Slovenia	SI																																														
Spain	ES																																														
Sweden	SE																											2.4/2.9/	1/2/	5/6/	3	4	5/7/	7	6	6	5/6/	6/7/	4/8/10/								
United Kingdom	UK																																														
Liechtenstein	LI																																														
Norway	NO																																														
Switzerland	CH																																														
Albania	AL																																														
Bosnia	BA																																														
Macedonia	MK																																														
Kosovo	XK																																														
Montenegro	ME																																														
Serbia	RS																																														
Belarus	BY																																														
Russia	RU																																														
Turkey	TR																																														

1.3.3.9 PO3 – 2025 number of OBUs required for each origin-destination pair

The O/D pair matrix for 2025 under PO3 assumes only 1 OBU for all journeys, i.e. full interoperability has been achieved through a top-down imposition of standards.

1.3.4 Split of EETS vs national OBUs per country through time

1.3.4.1 PO1: Split of EETS vs national OBUs per country through time

Table 1-24: Policy option 1: Split of EETS vs national OBUs per country through time

Country	2016		2020		2025		Comments
	EETS	National	EETS	National	EETS	National	
Austria	0%	100%	40%	60%	50%	50%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
Belgium	14%	86%	30%	70%	50%	50%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
Bulgaria	0%	100%	0%	100%	0%	100%	Self-regulation effects only applied to REETS countries
Croatia	0%	100%	0%	100%	0%	100%	Self-regulation effects only applied to REETS countries
Czech Republic	0%	100%	0%	100%	0%	100%	Self-regulation effects only applied to REETS countries
Denmark	10%	90%	50%	50%	80%	20%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
France	100%	0%	100%	0%	100%	0%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
Germany	0%	100%	10%	90%	20%	80%	Penetration rate increase curve lowered compared to PO2 due to possible lower effect of self-regulation
Greece	0%	100%	0%	100%	0%	100%	Self-regulation effects only applied to REETS countries
Hungary	0%	100%	0%	100%	0%	100%	Self-regulation effects only applied to REETS countries
Ireland	0%	100%	0%	100%	0%	100%	Self-regulation effects only applied to REETS countries
Italy	5%	95%	20%	80%	40%	60%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers.
Poland	5%	95%	10%	90%	20%	80%	Penetration rate increase curve lowered compared to PO2 due to possible lower effect of self-regulation
Portugal	100%	0%	100%	0%	100%	0%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
Slovak Republic	0%	100%	10%	90%	20%	80%	Part of the group of Eastern Europe countries which are of interest for EETS providers, but more specifically to those having an East-oriented strategy

Slovenia	0%	100%	30%	70%	60%	40%	New system from 1st Jan 2018 and opening to EETS 1st July 2018 (accreditation procedure under design)
Spain	100%	0%	100%	0%	100%	0%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
Sweden	10%	90%	50%	50%	80%	20%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
Switzerland	0%	100%	5%	95%	10%	90%	Considering the specificities of the Swiss tolling, both in terms of technologies and of procedures, and thus the extent of changes and investment that an opening to EETS would mean, we cannot expect an opening of the market to EETS
Norway	0%	100%	30%	70%	40%	60%	Outlook of Norway in terms of interoperability are good as it is already technically possible and Norway is part of EasyGo. A "cap" in the penetration rate stems however from the geographical (and meteorological) context of the country which limit the traffic of foreigners and thus the business case for EETS providers. This should not be much influenced by the European legislation.

1.3.4.2 PO2: Split of EETS vs national OBUs per country through time

Table 1-25: Policy option 2: Split of EETS vs national OBUs per country through time

Country	2016		2020		2025		Comments
	EETS	National	EETS	National	EETS	National	
Austria	0%	100%	50%	50%	70%	30%	Stricter legislation should speed-up the pace of the penetration of EETS in Austria in comparison to self-regulation (PO1), where ASFINAG would have an interest not to push unduly the opening to EETS
Belgium	14%	96%	50%	50%	70%	30%	Stricter legislation should speed-up the pace of the penetration of EETS in Belgium in comparison to self-regulation (PO1), where Satellic would have an interest not to push unduly the opening to EETS.

Bulgaria	0%	100%	0%	100%	60%	40%	As currently no technology-based tolling scheme exists, we could assume that the market opening will come later than the rest of the countries in the region, but with a high rate of penetration as the European market will already be mature
Croatia	0%	100%	30%	70%	50%	50%	Part of the group of Eastern Europe countries which are of interest for EETS providers, but more specifically to those having an East-oriented strategy
Czech Republic	0%	100%	30%	70%	60%	40%	Part of the group of Eastern Europe countries which are of interest for EETS providers, but more specifically to those having an East-oriented strategy
Denmark	10%	90%	50%	50%	80%	20%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
France	100%	0%	100%	0%	100%	0%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
Germany	0%	100%	30%	70%	60%	40%	Higher penetration than in PO1, due to stricter legislation
Greece	0%	100%	30%	70%	50%	50%	Part of the group of Eastern Europe countries which are of interest for EETS providers, but more specifically to those having an East-oriented strategy
Hungary	0%	100%	30%	70%	50%	50%	Part of the group of Eastern Europe countries which are of interest for EETS providers, but more specifically to those having an East-oriented strategy
Ireland	0%	100%	10%	90%	30%	70%	Should stay at the margin of the core interoperable market but should however be addressed by a couple of EETS providers
Italy	5%	95%	30%	70%	70%	30%	Stricter legislation should speed-up the pace of the penetration of EETS in Italia in comparison to self-regulation (PO1), where Telepass would have an interest not to push unduly the opening to EETS
Poland	5%	95%	50%	50%	70%	30%	Higher penetration than in PO1, due to stricter legislation
Portugal	100%	0%	100%	0%	100%	0%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers

Slovak Republic	0%	100%	30%	70%	50%	50%	Part of the group of Eastern Europe countries which are of interest for EETS providers, but more specifically to those having an East-oriented strategy
Slovenia	0%	100%	30%	70%	60%	40%	New system from 1st Jan 2018 and opening to EETS 1st July 2018 (accreditation procedure under design)
Spain	100%	0%	100%	0%	100%	0%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
Sweden	10%	90%	50%	50%	80%	20%	Part of the group of Western Europe countries which are priority in the roadmap of the EETS providers
Switzerland	0%	100%	0%	100%	0%	100%	Considering the specificities of the Swiss tolling, both in terms of technologies and of procedures, and thus the extent of changes and investment that an opening to EETS would mean, we cannot expect an opening of the market to EETS
Norway	0%	100%	30%	70%	40%	60%	Outlook of Norway in terms of interoperability are good as it is already technically possible and Norway is part of EasyGo. A "cap" in the penetration rate stems however from the geographical (and meteorological) context of the country which limit the traffic of foreigners and thus the business case for EETS providers. This should not be much influenced by the European legislation.

1.3.4.3 PO3 Split of EETS vs national OBUs per country through time

Table 1-26: Policy option 3: Split of EETS vs national OBUs per country through time

Country	2016		2020		2025		Comments
	EETS	National	EETS	National	EETS	National	
Austria	0%	100%	50%	50%	70%	30%	With PO3, the penetration rate of the EETS providers in the different countries should mainly follow the ones of PO2 but as the standardisation will allow the use of all OBUs (type 1 or 2) in all Toll Domain we can imagine the use of only 1 OBU in 2025
Belgium	14%	96%	50%	50%	70%	30%	
Bulgaria	0%	100%	0%	100%	60%	40%	
Croatia	0%	100%	30%	70%	50%	50%	
Czech Republic	0%	100%	30%	70%	30%	60%	

Denmark	10%	90%	50%	50%	20%	80%
France	100%	0%	100%	0%	100%	0%
Germany	0%	100%	30%	70%	60%	40%
Greece	0%	100%	30%	70%	50%	50%
Hungary	0%	100%	30%	70%	50%	50%
Ireland	0%	100%	10%	90%	30%	70%
Italy	5%	95%	30%	70%	70%	30%
Poland	5%	95%	50%	50%	70%	20%
Portugal	100%	0%	100%	0%	100%	0%
Slovak Republic	0%	100%	30%	70%	50%	50%
Slovenia	0%	100%	30%	70%	60%	40%
Spain	100%	0%	100%	0%	100%	0%
Sweden	10%	90%	50%	50%	80%	20%
Switzerland	0%	100%	0%	100%	0%	100%
Norway	0%	100%	30%	70%	40%	60%

1.3.5 Assumption on total numbers of OBUs and benefits to toll chargers from reduced OBU management

Assuming a fleet split of 75% DSRC OBUs and 25% GNSS OBUs, the total numbers and costs of OBUs are summarised in the following tables.

Table 1-27 Total number of OBUs under each policy option by year

Number of OBUs (1,000s)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Baseline National	1,598	1,548	1,498	1,447	1,397	1,358	1,319	1,281	1,242	1,203
PO1 National	1,598	1,522	1,445	1,369	1,292	1,219	1,146	1,074	1,001	928
PO2 National	1,598	1,419	1,240	1,060	881	787	693	599	505	411
PO3 National	1,598	1,419	1,240	1,060	881	762	642	523	403	284

Table 1-28 OBU cost assumptions for toll chargers

Cost Assumptions			
CAPEX	Purchase (€/OBU)	DSRC	10
		GNSS	156
		aver.	46.5
OPEX	Telecom costs (€/y/OBU)	DSRC	0
		GNSS	12
		aver.	3
	OBU Maintenance (€/y/OBU)	DSRC	0.34*
		GNSS	1.04**
	aver.	0.52	

*Note: 2% of the OBU fleet to be refurbished on a yearly basis, at 2€ (shipping) + 15€

** Note: 2% of the OBU fleet to be refurbished on a yearly basis, at 2€ (shipping) + 50€

Table 1-29 Resultant additional cash flow (€1,000) generated for toll chargers from managing fewer OBUs

Policy Option		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Baseline	CAPEX						75,788					
	OPEX	5,617	5,440	5,264	5,087	4,910	4,774	4,638	4,501	4,365	4,229	
	Total	5,617	5,440	5,264	5,087	4,910	80,562	4,638	4,501	4,365	4,229	124,613
PO1	CAPEX						68,031					
	OPEX	5,617	5,348	5,079	4,810	4,541	4,285	4,030	3,774	3,518	3,262	
	Total	5,617	5,348	5,079	4,810	4,541	72,317	4,030	3,774	3,518	3,262	112,296
PO2	CAPEX						43,915					
	OPEX	5,617	4,987	4,357	3,727	3,097	2,766	2,436	2,105	1,775	1,445	
	Total	5,617	4,987	4,357	3,727	3,097	46,681	2,436	2,105	1,775	1,445	76,226
PO3	CAPEX						42,497					
	OPEX	5,617	4,987	4,357	3,727	3,097	2,677	2,257	1,838	1,418	998	
	Total	5,617	4,987	4,357	3,727	3,097	45,174	2,257	1,838	1,418	998	73,470

2 Annex B – Analysis of responses from Task 2 consultations

2.1 Task 2.1: Stakeholder Consultation 2015

The targeted stakeholder consultation as part of the Ex-post Evaluation for the EETS Directive 2004/52/EC and Decision 2009/750/EC was launched on 26th June 2015 and was open for responses until 1st September 2015 (10 weeks). The analysis presented here provides a summary of the various responses received from stakeholders. Respondents were also given the opportunity to provide any further documentation at the end of the questionnaires – these have additionally been considered as part of this document, or in some cases they were assessed as part of Task 2.4,² which summarises the various stakeholder position papers received by the Commission.

Please note that the views presented here can only be associated to respondents to this specific consultation and may not be representative of the views of all or specific groups of stakeholders.

2.1.1 Analysis of respondents' profile

A total of **22 responses** to four separate questionnaires aimed at different EETS stakeholder groups were received from the European Commission, as shown in Table 2-1.

Table 2-1: Classification of stakeholders responding to the questionnaire

Stakeholder category	Number of responses	% of responses
Member States and toll chargers	15	68.2%
Toll Service providers	4	18.2%
Heavy-duty vehicle electronic toll users	2	9.1%
Light-duty vehicle electronic toll users	1	4.5%
Grand Total	22	100%

Due to the very different questions targeted at each stakeholder group and the free-text nature of the responses, the analysis below is split by stakeholder group. Under each stakeholder group section below, responses to specific questions are summarised as sub-sections.

2.1.2 Member States and Toll Chargers

Responses were received from 15 Member States or toll chargers, of which 12 respondents were national administrations and 3 respondents were motorway operators. Three of the respondents did not answer all the questions directly; these responses have been integrated under the questions where relevant. According to the responses received, the overall message is that EETS has the potential to provide many benefits including reduced costs for all stakeholders involved (financial, time and administrative). However, barriers to implementation remain, making widespread deployment of EETS unrealistic in the short-medium term. Reasons for this are varied and include:

- Ensuring interoperability with all existing toll schemes requires significant investment and effort to manage the technical and commercial requirements for pan-EU interoperability.
- Increased technical complexity and costs to interface with multiple parties and back-office systems.
- Difficulties in establishing robust toll collection and recovery processes to avoid toll evasion.

² Any position paper that was provided as supplementary material but not relating to the specific questions asked in this consultation were assessed in Task 2.4.

Answers to specific stakeholder questions from the European Commission, which have been categorised into respondent categories corresponding to national administrations and motorway operators, are as follows:

2.1.2.1 What are the possible benefits (incl. financial) from outsourcing relations with the clients to specialised companies?

Most stakeholder responses received agreed that many benefits arise from outsourcing relations with the clients to specialised companies; however the motorway operators also discussed some disadvantages. A summary of the main discussion is presented below.

National Administrations highlighted benefits from different perspectives, specifically EETS providers, toll chargers and road users.

EETS providers

Because EETS providers maintain relations with the road user and the administration becomes the EETS provider's task instead of the toll charger's, this leads to several benefits:

- EETS providers have specialised expertise and wider industry experience on aspects of the various toll systems. With better resources, skills and technology, and their business models focused on customer service provision, they can offer services in a more efficient, cost-effective and customer-service orientated manner, and can better keep up to date with advances in their fields.
- It provides a higher level of flexibility concerning the provision of services including customer relations, technical systems, financial transactions and billing and could lead to the emergence of additional services (beyond the authority's responsibility), provided by the EETS providers.
- It can lead to lower overall costs. For example, transaction costs for unregistered users versus registered users can be 8-10 times more expensive so actions that serve to increase ETC penetration will yield a return on investment.

Toll Chargers

Several benefits were highlighted for toll chargers, including:

- The administrative burden and costs for collecting tolls are lowered. They can economise on manpower (including reducing headcount, staff training and other related overheads) and investments in dedicated back office equipment without jeopardising high quality standards. This includes the cost and logistics of issuing OBUs being transferred to the service providers (who can share this cost across many domains) resulting in cost efficiency for the chargers. This reduction in cost does not necessarily mean that total cost, and therefore costs for road users becomes lower however.
- They can concentrate on their core business e.g. building/maintenance of infrastructure and traffic management, whilst the management of individual customers is kept at arm's length.
- The quality of data received regarding foreign vehicle registration and ownership is enhanced.
- They can share the expenditure for client relationships with other toll systems.
- The cost of credit control and payment of outstanding tolls is transferred to the service provider.
- For open road tolling systems, EETS can drive up compliance and collection levels, particularly for foreign traffic.

Users

Road users can also benefit in a number of ways:

- They are able to choose their contractual partner and the relationship can be processed in the client's national language. They also only require one business relationship for any number of toll systems.
- Having the choice of service providers ensures competition exists and provides the possibility to drive improved quality of service and cost competitiveness back to the users.

- They can utilise the expertise of commercial companies (with core competences in the field of customer relationship management) resulting in more efficient credit control solutions.
- They receive greater assurance as more familiar/recognisable brands can be used.
- As discussed further in Section 2.1.2.2, due to increased competition, service providers have the potential to extend the range of services they offer which may be favourable for the users, including the possibility of being charged a more reasonable price. However, this depends on whether the service provider is able to make the administration more effective, thus reducing administrative costs and leading to lower costs for the customers.

One Member State (with 26 toll domains) has had a national level service available for more than 20 years where ETC clients can pay their tolls through an external company. With 8 million users of the service, including users of private cars and commercial vehicles, it has experienced additional benefits including smoothing of traffic in toll plazas, frequent recurrent congestion now being limited, seamless travel facilitating user journeys, and strong take-up of the service nationally.

Motorway Operators similarly agreed that the use of specialised EETS providers avoids the need for toll chargers to maintain dedicated customer service teams internationally, making the businesses more efficient. End customers could also benefit through having a specialised service company available. The operators also believed management of toll evasion could be considerably easier through using EETS, thereby also justifying suitable remuneration for the EETS provider; the guaranteed transfer of funds to the toll charger when the transaction has been logged reduces the risk on toll chargers and transfers the burden for toll evasion to the EETS provider.

However, motorway operators also stated that losing direct contact with the end customer can be a major disadvantage of outsourcing, particularly if problems arise with the EETS provider(s). Generally costly fall-back solutions are required in case EETS OBUs do not work, whilst local / intra-national domains may remain the responsibility of the motorway operator, thereby resulting in a duplication of resources. However, in the long run this situation might differ.

2.1.2.2 What are the possible benefits (incl. financial) arising from introducing competition on a previously monopolistic market?

Similar to 1.2.1, stakeholders provided responses from three different perspectives:

- The benefits for users
- The benefits for EETS providers
- The benefits for toll chargers

Responses are summarised from these three perspectives.

National administrations identified benefits from all three perspectives. Respondents concluded that introducing competition on a previously monopolistic market means **users** are given the choice of operators/service providers offering better services and commercial conditions (lower prices, improved quality, additional services i.e. parking, fuel cards) and more favourable contracts. It was noted however that competition on tolling costs is 'not foreseeable' because of the inflexible nature of toll charges. It can also improve productivity of the road haulage industry, and can avoid duplication of equipment. Competition means that **EETS providers** have the potential to extend the range of services they offer and to expand into new markets, thereby offering economies of scale. Competition between OBU and other EETS equipment manufacturers will also ensure competitive pricing of equipment for providers. However, the requirement for full coverage of all EU toll domains within two years is a considerable risk for them.

When considering **toll chargers**, benefits listed by respondents are not as clear, which is probably due to respondents' different experiences. Some respondents noted that toll chargers' costs could be reduced as a result of a reduced need for redundant OBUs (discussed in Section 2.1.2.3), administrative and operational costs could be lowered, greater financial benefits for smaller toll domains could be realised, and competition could lead to innovation with respect to technical solutions and new services being offered. In addition, in the longer term the risks of relying on a single EETS provider could be reduced and EETS could provide easier migration to new service providers. However, other respondents suggested that there are no immediate benefits from competition; competition doesn't benefit toll chargers as toll chargers are required to accept an agreement with any EETS provider and the principles of 'fairness and equal treatment' have to be applied.

Motorway operators also had differing views as to the benefits of competition, again possibly due to different national circumstances. One respondent (from a country that has many different companies in the motorway operator market) suggests that an open market can encourage innovative solutions and the simplification of procedures, whereas another did not believe any benefits would arise unless EETS providers had to enter into a contract with every toll charger (as otherwise the only competition is for those toll chargers with good financial standing). Finally, another operator believed that increasing EETS provision could actually reduce competition, as it would reduce the number of operators, and costs could increase as a result of the need to supervise and enforce EETS activities.

2.1.2.3 What are the possible cost savings on redundant on-board equipment?

Respondents agreed in principle that savings on redundant on-board equipment could be made from the introduction of EETS. Savings result from a lower demand for national OBUs in preference to those of EETS providers, leading to both a saving on the initial investment and on the operational side. A summary of the viewpoints expressed by the stakeholders is provided below.

Several **National administrations** emphasised that savings could be made including savings for road users (equipment and service/replacement costs), and savings for toll chargers (able to distribute costs of providing users with OBUs across multiple toll chargers). On the other hand, it was noted that impacts could be negative for OBU suppliers as they benefit from having lots of different systems, and that OBUs are usually delivered as part of a bundle, with its costs being minimal compared to the toll. One Member State found it difficult to make a declaration on the subject due to a lack of sufficient knowledge.

Motorway Operators noted that savings for toll chargers are limited. This is because they have to hold multiple redundant OBUs in stock to ensure non-discriminatory access to multiple EETS providers and encourage competition.

2.1.2.4 What are the possible savings when introducing a new charging scheme or a new tolled infrastructure?

Almost all stakeholders recognised potential benefits when introducing a new charging scheme for tolled infrastructure, largely focusing on cost savings. The suggested possible savings reported by respondents are listed below.

National administrations noted a number of benefits including:

- Ease of introduction/reduced start-up costs – existing OBUs can be reused; EETS providers can in theory support every toll scheme in Europe; there will be an existing EETS registered customer base with current contracts from the start who can provide new toll schemes with instant access to a large customer base, thereby reducing risk; time-to-operations duration will be reduced as new systems can develop from proven technology, approaches and best practices; EETS compatible OBUs will work from the start meaning less administrative difficulties/costs; mutually recognised certified components can be used in new systems without extensive tests;
- Benefits to users – no extra inconvenience or costs as they can use an existing registered account and OBU for new toll domains;
- General cost savings – EETS could lead to systematically adopted electronic tolling infrastructure (which is cheaper to invest and operate than traditional tolling plazas); significant CAPEX and OPEX savings as new toll domains can automatically process vehicles registered elsewhere; economies of scale of the common toll service will become apparent if the number of users to be equipped should fall,

One Member State with a large proportion of private motor users noted that the benefits could also be magnified when considering all vehicle types for EETS.

Despite the generally positive view on benefits from national administrations, two respondents noted that most of their traffic was local or regional and that whilst they saw obvious cost-benefits in implementing local / regional interoperability, they did not see the benefit for pan-EU coverage.

Motorway operators felt that possible savings could include easier collection and control of tolls (new collectors have to comply immediately with the Directive's requirements and system compatibility is checked with equipment from all EETS providers), along with savings from reduced OBU requirements. However, it was noted that new tolling infrastructure would require additional testing effort, whilst some toll chargers are not looking for the compatibility provided by EETS.

2.1.2.5 Benefits and/or disadvantages for enforcement? Will enforcement become easier or more complicated?; which aspects influence this?

Respondents offered a more diverse range of opinions with regards to enforcement, and some responses can be categorised into benefits and disadvantages. The views of the respondents are summarised below.

National administrations felt that different aspects can influence enforcement efficiency. These can include: the use of different enforcement techniques; the quality of the toll charger's tolling system; the availability of vehicle and contract data for registered vehicles and hauliers; and access to address data for vehicles registered in other countries. Specific benefits and disadvantages reported are listed below.

Benefits of EETS with respect to enforcement include:

- Reduced (cross border) enforcement effort/increased efficiency – service providers guarantee toll payments for vehicles with a valid contract, and offenders can be identified easily from EETS provider databases.
- Reduced risks of fraud/foreign defaulters and reduced need for enforcement
- Improved communication between Member States to identify offenders and recover fines
- Collections can be treated by a provider operating in the road user's country of origin, which would undoubtedly facilitate enforcement under local laws

Disadvantages of EETS with respect to enforcement include:

- More comprehensive and complicated enforcement. Competition between EETS providers and relatively open standards could lead to multiple system designs, so the overall IT-architecture could become more complex, requiring continuous compliance and conformity testing
- The process of clarifying all circumstances related to any "substantiated toll non-declaration" between toll chargers and providers (according to the Commission Decision) could be a very demanding, time-consuming and wasteful process. The clarification process between several EETS providers (from other countries) could be very complicated and costly.
- Indirect costs for users – in the form of slightly higher tolls or in fees to service providers for full EETS, compared to that for a national service.

Motorway operators agreed with certain national administrations that enforcement will become more complicated with EETS implementation. Under EETS, the customer is unknown to the toll charger who is the one responsible for enforcement, and only direct contractual relationships exist between the customer and the EETS provider. Strong cooperation between the toll charger and EETS provider is therefore required, and the EETS provider should support/provide the charger with necessary customer data in an enforcement case. This could be challenging under differing national data protection laws.

2.1.2.6 Disadvantages of loss of control over the complete toll collection process

The responses to this question highlighted the varied attitudes on loss of control amongst the various respondents.

Five respondents representing **national administrations** agreed that they do not see any significant loss of control due to EETS (including one Member State with more than two decades of ETC application). Reasons included that as most toll chargers already use third parties to collect toll revenue (outsourced companies), they don't have direct control of all aspects today anyway, and that the introduction of EETS providers is no different from toll chargers contracting with fuel card users/credit card issuers that have worked successfully for over 40 years; the EETS provider agrees to carry out toll collections according to contractual requirements of the toll charger, and the charger is able to regulate activities of the provider through this contract.

On the other hand, another four national administration respondents felt that there is large potential for loss of control, and that this loss is not acceptable. Outsourcing could negatively impact effective control (unless risks can be mitigated by detailed procedures and adequate financial repercussions), and unclear responsibilities around fault detection could lead to extensive disputes. Distance-based road tolls using GNSS technology involve either the EETS provider or toll charger calculating vehicle movement and distance travelled. If this falls to the provider, the charger has lost control over distance calculated which might cause difficulties if different providers calculate it in different ways. One Member

State proposed that loss of control needs to be compensated through clearly verifiable, qualitative criteria concerning the service providers' reporting of toll charges.

Motorway operators concluded that while EETS can lead to the loss of relationship with the road user, this is compensated by the payment guarantee provided by the service provider. However, a detailed contract between the toll charger and EETS provider is necessary to contain and reduce the risk of evasion, and enforcement would undoubtedly become more complicated.

2.1.2.7 Possible costs/problems of interfacing with back offices of multiple toll service providers

The responses received provided mixed viewpoints regarding whether costs/problems will exist or not. However several respondents highlight the need for a common centralised interface/hub. Summarised opinions are outlined below.

Some **national administrations** suggested that costs and compatibility issues would arise from the use of different interfaces, and operating and monitoring with multiple EETS partners would lead to more technical, operational and legal burdens – and therefore higher costs. The main costs/inefficiencies would arise from a lack of consistency in the back office interface requirements (EETS is attempting to address this but there are still some ambiguities in the ISO 12855 standard). One Member State who is EETS compliant and uses international standards such as ISO 12855 noted that multiple service providers still use dialects of this standard, causing interfacing problems and risks to toll chargers. Therefore, each new interface to a service provider has to be carefully implemented and thoroughly tested creating delays and extra costs.

A more precise standard would help to alleviate this issue. Indeed, two respondents concluded that with interfaces between EETS providers and toll collectors being fully standardised (based on EN ISO 12855), no increased costs nor complications/problems should be expected. Three respondents went further, suggesting that in order to minimise risks and outlay, the interface with all EETS providers should be identical. Two of these respondents highlighted successful national schemes based on this concept, with a single central transaction hub, facilitating efficient interfacing between contracting parties. One **motorway operator** also suggested the use of a transaction hub as a means to facilitate implementation of EETS and to reduce costs.

2.1.2.8 Benefits from greater acceptance of tolling by the users in general

The responses received generally agreed that there were some benefits associated with greater acceptance of tolling by road users, as a knock-on impact of EETS, although some respondents disagreed. The views expressed are summarised below.

Most **national administration** respondents focussed on the benefits of greater acceptance of tolling by road users due to EETS. They believed that EETS could lead to a shift in public awareness and perception, helping tolling to be correctly viewed as a mainstream payment for a service. Specifically:

- Tolling would no longer be seen as a tax but a 'user pays' principle in return for quality service;
- Awareness would be raised about the fact road operations cost money and should be paid for by those who require their services;
- Offering a good user experience may further increase acceptance and users will recognise the need for revenue to be used to improve road infrastructure;

Other benefits were also highlighted, including:

- Reduced administration burden/costs – foreign language speakers no longer have to deal with registration, purchase and installation of an OBU; users can be billed in their own currency via one invoice removing the need to carry local payment means; simplified registration process for entering domains as users are registered by an approved EETS provider, hence they are automatically accepted and not required to stop; additional user convenience and 'one device – one contract – one invoice' principle fully aligned;
- Reduced fraud rate
- Rapid increase in account penetration – users become accustomed to tolling regimes and recognise the cost and convenience benefits arising from registering for an account. Even a small increase in ETC account levels means a beneficial impact on reduced operational costs.
- Greater acceptance of EETS as users are more likely to want a well-functioning electronic system that is as swift and painless as possible if they have to pay tolls.

Three national administrations disagreed and stated that users of EETS may not exhibit increased acceptance of road tolling; countries with long road/infrastructure user charging history may be more likely to accept it, whereas those with little experience of schemes and operators will require detailed, repeated communication and support to increase acceptance.

Motorway operator respondents stated that user acceptance would be enhanced by the existence of a single contract able to interface with all toll chargers, and EETS provides a more customer-orientated way to pay tolls.

2.1.2.9 Other: Please indicate if the benefits or the disadvantages dominate in the short and in the longer term. Please consider the costs and benefits independently of whether they are borne/allocated to the State, the toll charger or the user.

From the responses received, the common view was that in the short term, the disadvantages of EETS will dominate over benefits. However, the view for the longer term was more mixed. Summarised responses are presented below.

Most **national administrations** stated that EETS will bring overall disadvantages in the short run. Reasons proposed include:

- Lack of users equipped with EETS OBUs means there is very little benefit from introducing additional EETS providers.
- The deposit for an EETS OBU could be large and will only be justified for users if they can offset this cost against a reduced need to open several different accounts in multiple countries.
- Current EETS activities are at risk of being overtaken by Cooperative Mobility and Cooperative ITS (C-ITS) implementation - both technologies are at an advanced development stage and so EETS technology components implemented may become redundant in the near future
- The EETS Directive 2004/52/EC and Decision 2009/750/EC include a general objective but do not entirely define the ways (processes) to reach the objective, thereby limiting opportunities for successful implementation.

One respondent stated that benefits could arise in the short term if consideration is given to aligning resources towards advancing EETS in a C-ITS and Cooperative Mobility environment (it will enable Member States to make effective use of their resources instead of having to adopt a fragmented approach toward implementing separate directives). Socio-economic benefits could therefore be achieved in a short space of time.

In the longer run, national administrations had a more positive view of EETS. For example, one respondent envisages that the majority of haulage vehicles would be equipped with EETS OBUs as a matter of course in the long term and so would benefit from the introduction of additional EETS providers. Another considers that if EETS is advanced in a C-ITS and Cooperative mobility environment, operators will be able to identify a stronger business case for investing.

Motorway operators agreed that EETS is linked to high implementation costs for toll chargers and any benefits are difficult to estimate in the short term. In the longer run, possible savings may arise in the number of OBUs required, depending on how well interoperability is implemented.

2.1.2.10 Other: To your knowledge, are other technologies than the three specified in Art 2.1 of Directive 2004/52/EC and automatic number plate recognition (ANPR) used for electronic tolling in Europe (for instance RFID, infrared)? Please indicate the tolling schemes concerned.

From the responses received, it is clear that while some stakeholders do not have any other knowledge of alternative technologies, others are aware of their use in certain domains and believe these should be considered in future EETS legislation. The stakeholder responses are summarised below.

Six **national administrations** are unaware of any technologies used or planned to be used in tolling systems, other than the three mentioned in the Directive. However, other respondents highlighted alternative technologies being used including:

- **Infrared (IR) technology** – Three respondents noted the use of IR technologies in electronic tolling, including the Westerschelde tunnel in the Netherlands which uses IR DSRC as an electronic toll collection payment method, as well as the German TollCollect charging system which uses a multifunctional active IR 1Mbit/sec DSRC system deployed under the ISO TC 204 CALM standard for enforcement purposes. In addition, it was noted that this technology was

used in the London Congestion Charge technology trials undertaken by Transport for London between 2003-2005 and preliminary results demonstrated it worked just as well/if not better than CEN DSRC.

- **Passive RFID based tags** – Three respondents noted the use of passive RFID-based systems, including the Bosphorus crossings linking Europe and Asia. This toll domain covers some 2,000km of road and 387 lanes in 94 toll plazas with its RFID system. It is also used widely in the US and Middle East. Additionally, the Warnowquerung toll domain (Rostock, Germany) introduced RFID as an ETC payment method for motorcyclists in 2008. This solution was implemented primarily as a safety measure because of issues caused by motorcyclists stopping to wave their CEN DSRC tag under the beacon.
- **Contactless smart cards** – Although this does not fall strictly into the traditional ETC definition, the latest cards utilise near field communication (NFC) wireless technology which is synergetic to EETS. For example, the M6 toll road in the UK uses contactless smart cards, and with over 19 million cards now with NFC contactless functionality, there is an obvious future business case for toll chargers to adopt this functionality.

It was proposed by one respondent that instead of GNSS based devices, it would be possible to use the triangulation of signals from cellular communications devices as a means of position detection, however they did not believe it was sufficiently relevant for further consideration.

Motorway operators stated that no other technologies are known or used regarding (multi-lane free flow (MLFF)) network-wide electronic toll collection. Whilst some are aware of alternative technologies, concessionaires consistently choose to continue using the technologies specified in the Directive.

2.1.2.11 Please describe to your best knowledge the evolution of the cost of technology for electronic tolling since 2004. In particular, how has evolved the cost/price of: satellite OBUs; DSRC OBUs; enforcement devices (mobile and fixed); data transfer from satellite OBUs; back office systems; ANPR cameras; other components. Please quantify where possible.

The majority of respondents agreed that costs had reduced through time for various technologies and that other technological improvements had been achieved. For the purpose of this question, responses received are summarised into different technology groups.

Most **national administrations** were consistent in their views on how technology would evolve over time, with only two respondents disagreeing:

- Respondents generally agreed that the cost of **DSRC OBU** technology (to both the toll provider and user) has reduced significantly over the past decade (with one estimate of ~50% reduction) due to a combination of drivers including the technology maturing and the growing volume sold and in use (especially since 2010 when e-tolling was introduced on highways). Other changes noted include their reduction in size (to 'micro tag'), improved reliability and improved manufacturing quality. Only one respondent noted no significant evolution of the technology other than the normal dynamics, and that costs have not changed significantly.
- Respondents also generally agreed that **satellite/GNSS OBU** costs have reduced by around 50% since 2004, reaching a cost of around €100 per unit. Other advancements in GNSS OBU technology noted by respondents include their reduction in size and complexity and reduced requirement amongst some models to be permanently connected to the vehicle wiring, due to the introduction of windscreen mounting. GSM based communication costs were also highlighted as having decreased significantly, and the quality of service and speed of data transfer and coverage greatly improved. Accuracy of satellite systems has also improved according to respondents, due to factors such as advances in augmentation software algorithms. Only one respondent believed the price to have remained virtually unchanged (due to lack of competition among companies providing these systems on the market), whilst two others could not comment due to insufficient knowledge or access to data.
- Two national administrations commented on **enforcement systems (mobile and fixed)** and agreed that, whilst technology has significantly improved over the years, price has stayed within the same range for the last 7 years.
- While one respondent felt that **back office systems** have been subject to cost reductions, as well as improvements in storage technology and processing speeds, and have utilised cloud storage as part of recent innovation, another respondent concluded that substantial variation in

the type of system and the associated costs still exists. System approach and cost depend on whether the system is deployed based on a clean-sheet design, or to be adapted to existing systems – if a new system is being deployed as part of a change to an existing tolling system, this potentially gives rise to substantial development costs along with operational and transition overheads. Additionally, one respondent felt that costs for **back office systems** are now considered part of a service provider's normal operational costs.

- According to three respondents, the cost of **ANPR cameras** has decreased marginally over the last decade (due to increasing use for traffic and speed control purposes) whilst the efficiency and accuracy has increased significantly. Gantry costs are mainly determined by steelwork and labour prices, and enhanced compliance to new safety regulations. Costs for fixed enforcement gantries are between €550,000-750,000 for up to 5 elements, depending on the number of lanes to be covered (in both driving directions). ANPR performance improvement is stated to be a result of the application of machine vision technology (proven in other industry applications) to meet tolling requirements for ANPR systems. However, cost/performance aspects cannot be viewed in isolation, but rather as a combination of hardware, software and operational process improvements.
- **Other components** – It was noted by one respondent that automatic vehicle classification (AVC) is a critical component of any tolling system and there are numerous products on the market, ranging from in-ground loops / treadles to overhead profiling sensors (i.e. laser or optical). The AVC product market is competitive so costs of the sensor equipment are at a fair, equitable level. Costs must be viewed with associated operational costs i.e. a toll domain employing simple vehicle classification rules will be able to achieve efficient AVC ongoing costs whilst more complex classification rules require additional back-office processes and hence generate more cost. The UNECE vehicle classes being adopted for EETS are complex in that they cannot be readily identified by any AVC product currently on the marketplace. This means additional processes such as cross-referencing national vehicle registration databases are required to audit/verify vehicle classification. This adds to OPEX but is necessary to avoid additional customer service costs arising from responding to customers who were under-charged or over-charged. It is possible to mitigate such costs by introducing alternative business processes (e.g. trusting the vehicle class stored on the OBU) but changing business rules also brings additional upfront costs associated with changing legacy software and training operatives. It is currently not a major issue for satellite tolling because such systems are primarily deployed in HGV charging applications. However, vehicle classification will become a satellite tolling cost consideration if and when the application is rolled out across other vehicle classes.

Motorway operators' views were consistent with national administrations, in that they have observed DSRC costs to have decreased significantly over the last 10 years. OBU prices have reduced by at least 50% and operating systems costs have also reduced significantly. This is due to increasing vehicle throughput and the expansion of the network.

2.1.2.12 [Question to ASFINAG, BAG, Toll-Collect, Swiss customs administration: Please describe your experience from the existing interoperability agreements between toll chargers, in which you have been involved \(interoperability between Germany and Austria or Austria and Switzerland\). What are the difficulties in signing and operating such agreements? Is interoperability introduced under such agreements more or less costly than interoperability provided by third parties \(toll service providers\).](#)

The national operator **Toll Collect** operates nearly 1 million multi-technology OBUs (GNSS and DSRC) in the market, and these are suitable for future interoperability requests by users. They therefore proposed to develop interoperability between their systems and those of **ASFINAG**, another tolling operator. This agreement was the start of **Toll2Go** between **Austria and Germany**, which was launched in September 2011. Toll2Go is based on existing Toll Collect OBUs and users simply register for the service in both toll domains. This was the first European cross-border interoperability service suitable for use with both the satellite-supported German system and the microwave-based Austrian system (GNSS-DSRC). As of June 2015, it had more than 90,000 registered vehicles and has run seamlessly for 4 years with outstanding customer feedback. Toll2Go has shown that interoperability offerings are accepted by users. However, Toll2Go only covers the technical side, so customers still need to enter into separate contracts with the two systems, so tolls must be paid separately to each

operator. Difficulties can arise when proprietary technical systems need to be connected that do not follow proper technical standards for electronic fee collection.

ASFINAG, in preparation for EETS, also joined the **EasyGo** consortium in 2009, which led to **EasyGo+** going into operation in 2013. EasyGo+ was the first example of contractual interoperability between toll systems in 4 European countries. Lessons learned include:

- Interoperability is time-consuming and cost-intensive
- It's a service for the user, but whilst savings may be made on reduced requirements for OBUs, overall savings may be difficult to achieve due to increased costs elsewhere (e.g. service provider fees)
- Interoperability projects need confidence, full transparency and commitment from all parties involved
- The technical **and** cultural differences should not be underestimated
- Different stakeholders with various goals have to be involved at a very early stage (ministries, shareholders, partners)
- A well designed quality measurement system is very important
- Implementation of interoperability purely from the technical perspective (i.e. with 2 contracts) is easier than achieving technical and contractual interoperability (1-contract, according to EETS)

With the introduction of the **Austrian GO Maut system** in 2004, the first **interoperable electronic tolling system between Austria (ASFINAG) and Switzerland (Federal Customs Administration)** was implemented. This was carried out in order to gain practical experience, not in order to save money. It was introduced for the benefit of a limited number of users of Swiss OBUs. The solution led to additional costs for the Federal Customs Administration without any direct added value. Additional findings from this initial experience of interoperability were as follows:

- Similarly to EasyGo+, interoperability solutions were found to be time-consuming and cost-intensive. Even for a relatively small number of users, the solution has to meet the same quality demands as national collection services.
- Interoperability between Switzerland and Austria is technical, but in contractual terms users continue to maintain relationships with ASFINAG and the Federal Customs Administration respectively.
- Purely technical interoperability is considerably simpler to implement than EETS with a single contractual agreement for the user, but in practical terms it gives rise to drawbacks as it is not always clear to the user who is responsible for what.
- Interoperability is not implementable without the necessary preparedness, transparency and mutual trust between all involved parties.
- Cultural proximity between the involved parties significantly enhances understanding.
- Bilateral solutions between toll chargers with several neighbouring countries are not suitable because the costs far outweigh the benefits.
- Alongside mutual trust, clearly defined quality criteria and their monitoring are also essential.

ASFINAG stated that the interoperability projects described above were introduced through bilateral initiatives between the relevant toll chargers. The majority of the lessons learned resulted in updated requirements for the Austrian EETS Domain Statement.

Another motorway operator, **ASFA**, has had experience with two systems in France that represent interoperability agreements (**Liber-t**, an inter-toll collector agreement and **TIS-PL**, a collectors/service system). With this experience, they propose the need to relax the most obvious constraints that may discourage others from entering into EETS agreements as set out in the Directive and Decision, for example full coverage of all EU toll domains within 24 months from registration. They feel the rest of the principles, applied in a reasonable way, are sufficient.

2.1.3 Toll Service Providers

Responses were received from four organisations involved with the provision of toll services, one of which was a trade body, two were toll service providers and one was a company providing equipment to toll service providers. Two of the responses did not answer the questions directly; these responses have been integrated under the questions where relevant, or otherwise covered under 'additional

information' (Section 2.1.3.9). The overall message was that while there is a market for interoperable tolling services for HDVs, it was difficult to assess its size, but that there was only limited demand for such services for LDVs. Fees paid to fuel card issuers were generally considered to be very low, but it was noted that fuel cards should not be seen to be a distinct means of payment. Toll service providers perform many different services to their customers, and to toll chargers, but transport companies will not be willing to pay more for EETS. While a lack of harmonisation was considered to constitute an obstacle to providing interoperable services, it was argued that this should be addressed through the harmonisation of the application of existing standards, rather than through the development of new standards.

2.1.3.1 Based on your experience with customers, can you estimate the size of the market for interoperable heavy duty vehicle (HDV) tolling services in Europe? How many lorries and buses travel regularly through several electronic domains and would thus be interested in interoperability? How many trucks engaged in cross-border transport are today equipped with 2, 3, 4 or more OBUs?

Toll service providers believe that a market for interoperable electronic tolling exists for vehicles above 12 tonnes. There are several TEN-T routes that cross three to five countries and it is common to see trucks with three to six OBUs on their windshields. However, it is difficult to identify the number of trucks and coaches that use cross border routes. There are few logistics companies that have fleets that go to all EU countries; additionally, trucks are not generally confined to cross-border routes. They can be used internally or for international travel, depending on the contract.

Using existing examples of regional interoperability agreements, it was estimated that the market could be 650,000 trucks in France/Spain/Portugal and perhaps 100,000 in Germany and Austria, out of a total of 750,000 trucks that operate in these two countries. There are various cross-border initiatives, which underlines the need for a decision as to whether such regional cross-border initiatives are more favourable than an EU-wide EETS approach. Figures for Austria demonstrate that there are nearly 800,000 contracts with vehicles from other countries, which can be taken as an indicator of demand for interoperability in a transit country (see Table 2-2); in addition, nearly 200,000 Austria trucks crossed the national borders on motorway routes in 2014.

Table 2-2: Contracts for Go-Boxes by country of origin

GO-Box Distribution

(existing contracts according to countries – as at 14.08.2015)

Country	GO-Boxes (existing contracts)	GO-Boxes (existing contracts in %)	TOLL2GO (D) active	EMOTACH (CH) active	Cumulative (active contracts)
Germany	182.436	23,15 %	43.318	127	225.881
Austria	90.567	11,49 %	2.171	6	92.744
Poland	81.135	10,30 %	11.132		92.267
Italy	43.929	5,58 %	634	16	44.579
Czech Republic	37.606	4,77 %	8.851		46.457
Netherlands	21.181	2,69 %	6.850		28.031
Hungary	40.218	5,10 %	2.449		42.667
Romania	54.248	6,88 %	2.598		56.846
Slovakia	26.398	3,35 %	2.770		29.168
Spain	18.043	2,29 %	3.245		21.288
Others	192.184	24,39 %	8.073	2.912	203.169
Total Result	787.945	100,00 %	92.091	3.061	883.097

Source: ASFINAG

One of the respondents believed that the implementation of EETS would reduce the number of providers, as a result of the limited market, high risks and large investment needed. Additionally, it was argued that the EETS market was dependent on the business models proposed by Member States and toll chargers. However, the presence of an EETS OBU in a vehicle will not necessarily mean that the vehicle will not have any other OBUs, as operators will choose to use the equipment in a country that they find most advantageous.

2.1.3.2 Could you indicate the average fees (in % of toll paid) users pay today to intermediaries such as fuel card issuers for services linked to toll collection (providing the OBUs from different toll domains, acting as financial intermediary for toll collection etc)? What are these services?

Based on your experience, how much more would you expect the users to be willing to pay for EETS, compared to the current services offered by fuel card providers?

Toll service providers were not able to provide information on average fees, largely as a result of commercial sensitivity in what is a highly competitive market. One provider argued that large transport companies had a strong negotiating position regarding toll service providers, so fees can be zero or close to zero, although this varies by country. In some cases, fees are effectively negative as bonuses can be given if contracts are continued. Fees from road users are not a stable source of income for toll service providers; it is the fees paid by toll chargers that are important for the development of a positive business case. It was also noted that fees are generally less than the rental fees for OBUs.

With respect to fuel cards, it was noted that these should not be seen as a distinct 'payment means', as they are generally provided to drivers in order to avoid giving drivers cash or credit cards to pay for fuel and in some cases tolls. The use of fuel cards is the result of bilateral agreements; toll chargers have no obligation to accept fuel cards.

Toll service providers perform many services for their customers, including:

- Management of relationships in various languages and currencies, where necessary;
- Customer registration or supporting company registration;
- Provision of a valid personalised OBU and ensuring after sale service of the OBU;
- Acceptance of OBU for toll collection in all toll domains where the service provider has negotiated its OBU acceptance;
- Payment of tolls to each toll charger on behalf of its customers;
- Sending detailed information of the toll transactions made;
- Taking responsibility for any customer relation regarding toll operations, tariffs, rebates etc.

With satellite-based OBUs, services may extend to using real time geolocation, including improved information on toll consumption, truck tracking and geo-fencing. Toll service providers also provide services to toll chargers.

Given the financial situation of transport companies, they will not be willing to pay more for EETS, preferring to maintain several OBUs rather than paying more. Hence, EETS needs to be competitive with national toll schemes and provide a significant advantage.

2.1.3.3 Could you estimate the size of the market for interoperable tolling services in Europe for light vehicles (car, vans)?

Toll service providers estimate that the size of the market for interoperable tolling services for light duty vehicles is limited. Light commercial vehicles tend to travel shorter distances than HDVs and if they cross a border, it is only to a neighbouring country. For cars, there might be some demand for business travel and holiday traffic, and more generally in some border regions, but this was considered to be limited. Once interoperability for HDVs has been achieved, it might be possible to offer interoperability to LDV users at a marginal cost. Alternatively, if a large country such as Germany were to introduce electronic tolling for LDVs, demand for interoperability might increase.

2.1.3.4 Are commercial light vehicle (e.g. vans, minibuses) users using fuel card providers as intermediaries for obtaining OBUs or paying tolls abroad?

Toll service providers believe that some LDVs do use fuel cards abroad, but that the numbers are small and concentrated in a small number of countries. The use of fuel cards abroad by light duty vehicles is most common where a transport company operates both heavy and light commercial vehicles. As an indication of the limited scale of potential demand, in 2014 in Austria, 80% of LDV drivers paid tolls in cash, with only 20% making cashless payments. Many countries operate vignettes for LDVs; if these were replaced by electronic tolling, the scope for interoperability could increase.

2.1.3.5 Do you see - based on your business experience - significant demand for interoperability of electronic tolls with third countries? Which ones - Switzerland, Norway, Turkey, Western Balkans, Belarus, other?

Toll service providers believe that there is a demand for interoperability of electronic tolls with third countries, which is largely proportional to the volume of traffic. There is limited demand from

international big accounts for countries such as Switzerland or Norway. It should be noted that with respect to Turkey, there is a technology issue as Turkey uses RFID.

2.1.3.6 Do you have a significant amount of toll transactions from "peripheral Member States" (such as Ireland, Greece, Portugal, Finland or the Baltic States)?

Toll service providers do not see a significant amount of toll transactions from peripheral Member States, as illustrated by the transactions for LDVs in the Austrian electronic toll system for these Member States in 2014 presented in Table 2-3. Achieving interoperability in the central EU Member States would enable this to be expanded to those countries on the periphery if they accepted full compliance with the scheme.

Table 2-3: Transactions involving light duty vehicles in the Austrian electronic toll system in 2014

Vehicles < 3.5 tons 2014

	Country	Result
IE	Ireland	807
GR	Greece	2.127
PT	Portugal	3.486
FI	Finland	513
EE	Estonia	1.561
LV	Latvia	3.854
LT	Lithuania	12.343
	Summary	24.691

Source: ASFINAG

2.1.3.7 Does the lack of harmonisation constitute an important obstacle for you to offer interoperable tolling services? If yes, is it a problem of lack of application of existing standards, or should new standards be developed?

Toll system providers agree that the lack of harmonisation can constitute an important obstacle. However, technical harmonisation is not just a case of developing and applying standards; it is also about the way in which the standards are applied, interpreted and managed in detail. Rather than developing new standards, it would be better to harmonise the way in which they are used, with a particular focus on satellite technology. While many toll chargers claim to be compliant with ISO12855 in the area of back office interfaces for data exchange, the way in which this standard is implemented varies. From the perspective of toll service providers, there is a need to define in detail how ISO12855 should be applied. Similar requirements could also usefully be developed for acceptability and suitability of use tests for OBUs.

A company that supplies technology for road tolling agreed that the standards were largely in place, but that standardisation bodies were not able to further restrict the options provided by the standards, as they have to cover the requirements of local legislation, legacy systems and all members of a particular standardisation group.

2.1.3.8 In your opinion, would allowing more technologies (e.g. RFID tags) to be used for electronic tolling create additional obstacles to achievement of interoperability?

From the perspective of toll service providers, allowing additional technologies in the short-term would create additional obstacles, but should not necessarily be ruled out in the longer-term. Currently, with the three technologies allowed today, there is still no viable technical solution that can be used on all networks and that is EETS-compliant. Allowing more technologies would require additional rules, bringing more constraints on IT interfaces and requiring new OBUs, and so would not speed up the implementation of EETS.

However, all of the technologies allowed by the Directive could now be considered to be mature technologies. If a new technology provides added value compared to the currently allowed technologies in terms of costs and technical performance, its introduction should be allowed after a transition period.

2.1.3.9 Additional Information

Toll service providers also provided a position paper, which was included in the summary of spontaneous responses (see Task 2.4) and a detailed set of amendments that they would like to see in the legislation.

A company that supplies technology for road tolling argued that the reason that EETS has not appeared anywhere in Europe is because no organisation has been willing to act as a fully-fledged EETS provider. Local operators have business models that work, and a familiar regulatory environment, whereas EETS would reduce their revenue and require complex new relationships. Further, they argued that there is no business case for EETS providers as the acceptance procedures for different toll chargers are fragmented, the potential revenue is small and uncertain and EETS providers would have to comply with the diverging requirements of different toll chargers.

They argued that progress towards EETS requires a more restrictive regulatory framework to: restrict the technological options that must be covered by EETS equipment; centralise acceptance procedures and certification for EETS providers and their equipment; introduce rules on the fair sharing of income and revenue between EETS providers and toll chargers; and introduce clear rules on the extent of the obligation to cooperate for toll chargers.

A toll service provider set out a number of recommendations based on their experience of gaining EETS registration. First the registration requirements need to be clarified, as do the assessment criteria relating to financial standing, while the conciliation body should be made accessible to applicants for EETS registration, not just successfully-registered EETS providers. In relation to the process of accreditation of EETS providers, they recommended that registered EETS providers should have the right to enter the accreditation process during the introduction of a new system allowing them to offer EETS from the start of the new system and for a scheme to ensure the mutual acceptance of the results of accreditation processes between toll domains. With respect to remuneration, they recommended the definition of explicit principles for remuneration and the inclusion of the principle of non-discrimination between EETS providers, national providers and other toll service providers with respect to *inter alia* the commercial terms of the toll service in a toll domain. While supporting the aspiration that an EETS provider should cover all EETS toll domains, the provider recommended that there should be no time limit put on the delivery of this aspiration. It was also argued that there was a need for a central European body to be responsible for EETS operational issues, including the provision of binding operation guidelines, and perhaps even becoming a pan-European conciliation body. Finally, the toll service provider recommended that an obligation be put on EETS toll chargers to provide geo data if necessary for the EETS providers.

2.1.4 Heavy-Duty Vehicle Electronic Toll Users

Responses received from this stakeholder group represent haulage associations for both larger and smaller fleet operators, with one respondent for each. Because of this and the differing responses provided, they have been treated separately for this analysis. Additionally, due to the large number of questions asked and because the respondents didn't respond directly to these, this stakeholder analysis section is not categorised by question.

2.1.4.1 Larger Operators

According to the respondent representing the large HDV fleet operator, a study by Prograns in 2010 identified that in 2007, foreign hauliers represented on average 30% of the total user charge revenues in the EU and close to 50% in transit countries such as France. Subsequently, in various projections by both Prograns and the European Commission for 2020, foreign hauliers would represent up to 36% of the total road user charge revenues in the EU, exceed 50% in France, and increase from 25% to 40% in Germany. This indicates that the potential market size for interoperable HDV tolling services is set to increase, and they consider between a third and a half of the EU road haulage market to be potential EETS users. With almost all EU trucks being equipped with at least three or four on-board units (OBUs) and some with more than a dozen, considerable administrative burdens and costs exist for operators. This includes the need to sign an equivalent number of electronic tolling contracts with national and local service providers as the number of OBUs owned in order to pay for the use of road infrastructure.

The respondent agrees that while some intermediaries such as fuel card issuers are already facilitating toll payment across several Member States, none cover all electronic toll domains across the EU or fully solve the problems linked to the lack of contractual and procedural interoperability. These

intermediaries constitute a partial solution to the objective defined in the Directive 2004/52/EC and Decision 2009/750/EC, namely “one OBU - one contract – one invoice”. They allow road freight transport operators to deal with only one invoice, but they still have to carry as many OBUs and to sign as many contracts as there are toll chargers, with the same burden, administrative fees and maintenance costs attached. The respondent supports an adoption of the full objective approach where one single market can be established and road freight transport operators would deal with one provider, one contract and one invoice, providing it would reduce costs and administrative burden for operators – operators should only have to pay fees with one provider and only invest in one electronic system to pay user charges.

The HDV road user stakeholder stated that progress has been made in the last 10 years, with electronic road tolls becoming more widespread, in particular in countries where the vignette system was replaced with distance-based electronic tolling systems.

However, it has been over ten years since the objective for a fully interoperable EETS was set by the EU, yet it has still not been realised nor has action been taken against non-compliant Member States. The respondent feels that a lack of interoperability has resulted because of a series of legal, commercial, financial and technical obstacles, mostly regarding the rights and obligations of EETS providers and of toll chargers, as well as the lack of action at governmental level. Obligations on EETS providers to provide bank guarantees (equivalent to 1 month of toll transactions) and full EU-wide toll domain coverage within 24 months of registration have been impossible to meet. Additionally, contracts between states and toll chargers are limited to their national territories. This means toll chargers are reluctant to open their own markets to competitors, including EETS providers, which is creating a major challenge for the EU in tackling long-duration exclusive contracts between toll chargers and providers.

For EETS to be successful, EETS providers should continue to be required to provide one single financial guarantee covering the whole EU, however toll chargers must open up existing contracts and not limit contracts to national markets, and technical harmonisation of national e-tolling systems must be guaranteed. Provided that EU interoperability can be achieved, the respondent expects it would be welcomed as a minimum by EFTA countries where the EU has agreements covering the road freight transport market and with all neighbouring countries operating e-toll systems.

The respondent believes that road operators would not be prepared to pay any more for EETS services compared to current services and the realisation of a single market for e-tolling will require a binding roadmap to make existing and new toll operating systems interoperable. They expect an overall cost reduction for EU hauliers, with savings on general administrative burdens, contract fees, OBU costs and maintenance, as well as avoidance of higher toll or user charges compared to national and local providers.

Finally, the respondent feels overall that it would be a mistake to renounce the objective for a fully interoperable EETS and support R-EETS as an intermediary solution. This is because there is no guarantee it would succeed and the only guaranteed impact would be a further postponed realisation of EETS. They believe an investigation into technical and market solutions should be proposed which looks at what allowed the mobile telephone market to become fully interoperable across the EU and whether this can be translated into the e-tolling market.

2.1.4.2 Smaller Operators

The respondent representing the smaller fleet HDV electronic toll user considers the deterioration of EU road infrastructure as an important issue for their member organisations and associated road hauliers. With many Member State governments’ budgetary cuts targeting road infrastructure, this creates a negative impact on the quality and capacity of road infrastructure. This in turn can lead to reduced accessibility, greater chance of traffic congestion, negative emission impacts and higher maintenance expenditure in the longer term. They feel users who pay for transport infrastructure are entitled to good quality.

The respondent is therefore in favour of the current vignette system being abolished in favour of a distance based toll system, such as EETS, making use of a single European OBU. They consider the current vignette system does not follow the good practice approach of the ‘user pays principle’; only distance-based charging systems based on GNSS can guarantee correct implementation as it is dependent on distance travelled and the emission standard the vehicle complies with. Indeed, they feel that the vignette system currently in place in many markets is discriminatory, for example in terms of the likelihood of being caught without having purchased a vignette. Foreign trucks in possession of a

daily or weekly vignette are much less likely to be caught compared to road hauliers with a compulsory yearly vignette. If phasing out of the vignette is not possible, organisations should opt for the maxima as set in the Eurovignette Directive.

The respondent agrees that transport operators receive sufficiently clear price signals to optimise their operations, and road charging imposes an extra stimulus for hauliers to avoid empty kilometres for which clients do not pay. The German LKW-Maut system illustrates this well, as it enables efficient environmentally friendly investment choices and provides predictability for future changes – hauliers have knowledge of the charges that different vehicles will face in the future.

The respondent strongly agrees that the lack of interoperability of electronic tolls is a significant problem and source of costs for hauliers, and that it is partly responsible for the very high cost of setting up and operating electronic tolling schemes. They agree that despite the 2004 EETS Directive and the subsequent Decision on electronic tolling, neither Member States nor the regions are rushing to align various systems in use. Tolling systems have been introduced on road networks in 22 Member States for HDVs and in 12 Member States for passenger cars; this is equivalent to approximately 72,000 km of roads within the EU.

While 60% of these tolled roads are equipped with electronic tolling and more than 20 million road users have subscribed to e-tolling road schemes, these systems (that should be interoperable) are still generating administrative burdens and costs. An issue for interoperability highlighted by the respondent is the fact that toll domain-specific requirements beyond established standards can cause problems. Two Member States can decide to use the same technology but have different approaches based on specific national circumstances, and an example given to illustrate this point is Germany and Belgium. Both Member States have road pricing systems using OBUs with GNSS technology, but each system cannot be used in the alternate country. This is because even though both systems are built by the same IT and data communications companies, the working conditions imposed by the respective governments are different, creating extra costs for road hauliers.

The respondent supports the statement that while some Member States have adequately transposed the EETS legislation and created fair market conditions for EETS providers, other Member States have not (completely) transposed the legislation and have opted to protect their single service providers. The respondent believe this has happened because concessionary services very often have long term contracts with national governments for operating and maintaining road infrastructure, and these cannot be changed without significant compensation. These toll chargers or single service providers therefore have limited interest in changing their system (for example from DSRC to GNSS or other administrative or technical changes required to fully implement EETS) or allowing other service providers access to their toll domains. The respondent believes the authority of these providers has a large enough influence on Member States for them to be reluctant to change the way of registering and paying road charges, and this subsequently provides a barrier to entry to market for any single EETS service providers.

The stakeholder states that theoretically there is a business case for EETS, but this has not been clearly developed in the Directive or Decision. They propose that a national charging system could be based on a single EU-wide OBU that is installed to all trucks during manufacturing, and the Galileo satellite system could be used for this, registering tolled kilometres in each Member State. Data processing could then be left to the single service providers. They feel that policy makers need to take into consideration cost and user friendliness of the chosen system when determining the technology chosen for tolls, and therefore one single device to register and pay tolls in different Member States is the way forward - economies of scale can be realised and hardware costs reduced. In contrast to the response from LDV users, the respondent believes that there is a need for cross-border interoperability for passenger cars also and, as proposed for trucks, one should strive to develop one cross-brand EU-wide OBU installed during car manufacturing.

From the technological perspective, the respondent notes that for EETS, all possible technologies should be taken into account, and the exclusion of one from the scope (Art 2.1 of the Directive) e.g. RFID could be an obstacle for the wider application of the user-pays and polluter pays principle. If a Member State wants to start a road charging system based on a new technology it should be perfectly interoperable with the existing technologies. The legislation should therefore be technology neutral with options left open, as it is difficult to predict today what the most successful technology will be in the future. As stated by the large HDV operator respondent, the respondent proposes that if EU roaming

for phones or worldwide interoperability for credit cards was successful, it should also be possible to develop EU-wide electronic tolling interoperability.

Finally, the respondent also proposes that Member States should be forced to collaborate formally to ensure access each other's vehicle registration databases. If not feasible, a centralised database by an independent EU body should be imposed, linking all national databases to facilitate exchange between service operators and enforcement bodies, and thereby reducing the burden of toll evasion on toll chargers.

Other than the above-highlighted issues, the respondent believes that the scope of current EETS legislation is broadly adequate, and, similarly to the larger operators, that the requirements for full EU-coverage should be maintained.

2.1.5 Light-Duty Vehicle Electronic Toll Users

There was only one respondent for this particular stakeholder group. The key message concluded from this analysis is that there is no need for EETS for light duty vehicle users, and problems have arisen regarding existing systems in place, as described in Section 2.1.5.3. As long as the tolling systems in place are in accordance with EU law and do not discriminate any Member States, different systems between toll domains aren't seen as a barrier. The "hassle and costs of compliance with the requirement to pay road tolls" cited in the European Commission's 'evaluation and fitness check roadmap' document p.4 are considered overstated, and the view that "users would be more ready to accept to pay for using roads if the payment means are interoperable at EU level" (p.3) cannot be supported. Answers to specific related questions for LDV users are described below.

2.1.5.1 Do you think that light vehicles would need EETS? Would they be inclined to pay for it, if needed? If yes, how much/ how much more than for existing services offered by fuel card issuers/other intermediaries?

The LDV respondent considers that there is no need for EETS, and cannot see drivers paying any extra than they currently do. This is because most users experience no significant issues with current tolling methods, while some have even had negative electronic tolling experiences in some EU countries. If electronic systems are set up for LDVs, efforts must be made at EU level for agreement about which technology to be applied, and for the sake of consumer protection, road charges should be imposed in a fair, transparent, easily accessible and non-discriminatory way in all EU countries.

2.1.5.2 Based on feedback from your members, is there need for an EETS covering the entire EU, or would interoperability between main transit countries meet the needs of the majority of the users?

From the light vehicle user perspective, neither EETS covering the entire EU nor presence in the main transit countries is deemed necessary. The respondent agreed with the relevance of EETS for the full and proper functioning of the internal market, but only concerning freight traffic and not private users.

2.1.5.3 Please describe to your best knowledge how the cost of compliance and administrative hassle for your members related to electronic payment of tolls has evolved since 2004.

Examples of recent issues for LDVs were provided by the stakeholder, which all highlighted the problem of payment difficulties with some current tolling methods. For example, in both Hungary and Portugal, members receive payment demands for the utilisation of roads whilst not being eligible for payment. These involve number plate recognition or detection not being carried out correctly, or the authorisation of credit card details from the company to the toll booth not working, respectively. In Poland, members have also had difficulties with payment of charges using the viaBOX in freight traffic (a small on-board electronic device that transmits encoded information about the vehicle to receptors installed on gantries when passing beneath them).

2.2 Task 2.2: Stakeholder Consultation 2016

The stakeholder consultation for this project was launched on 5th October 2016 and was open for responses until 13th November 2016 (six weeks). Respondents were also given the opportunity to provide any further comments at the end of the questionnaire. This analysis of the stakeholder consultation is intended to provide an overall view of the responses to the questionnaire, as well as a summary of the additional comments provided.

Please note that the views presented can only be associated with respondents to this specific consultation and may not be representative of the views of all or specific groups of stakeholders.

2.2.1 Analysis of respondents' profile

A total of **35 responses** to the questionnaire were received. The responses covered a variety of different and combined stakeholder groups, which have been further categorised during the analysis. The reason for categorising further was due to the large variation in response rates for each of the original categories, as well as the fact that certain respondents associated themselves with more than one stakeholder group. By reorganising the groups in this way, a more even balance can be obtained and conclusions drawn from the analysis can be attributed to more specific stakeholder groups, thereby making them more meaningful. Any quantitative analysis presented by these stakeholder groups only includes results representing above 5% of respondents, to avoid giving too much importance to minority views.

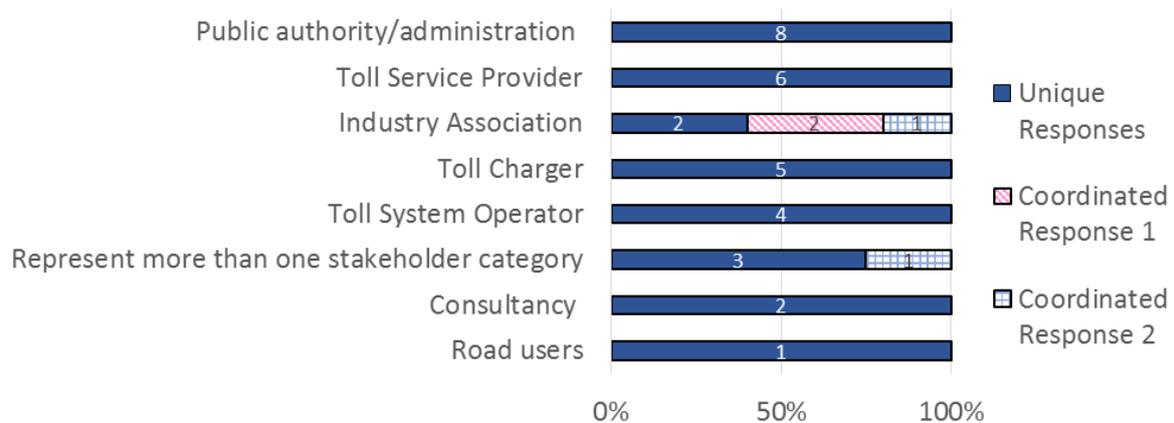
The stakeholder groups used for analysis are shown in Table 2-4 below.

Table 2-4: Classification of stakeholders responding to the questionnaire

Stakeholder category	Number of responses	% of responses
Public authority/administration	8	23%
Toll Service Provider	6	17%
Industry Association	5	14%
Toll Charger	5	14%
Represent more than one stakeholder category	4	11.5%
Toll system operator	4	11.5%
Consultancy	2	6%
Road users	1	3%
Grand Total	35	100%

Note: Representing more than one stakeholder category is based on the respondents' choice and includes Public authority/administration & toll charger & toll system operator; public authority/administration & toll charger; toll service provider & industry association; and road user & industry association.

Figure 2-1 Distribution of the responses by stakeholder group – showing co-ordinated responses



Two coordinated responses were identified from the analysis of the samples, as shown in Figure 2-1, indicating that these respondents followed a template for answers. However, since respondents were free to adapt the answers to correspond with their own views, all responses have been analysed individually in the following sections. The total number of coordinated responses identified was four, representing 11% of total responses.

Responses were received from respondents residing in, or organisations based in 16 EU Member States (Austria, Belgium, Czech Republic, Denmark, Estonia, France, Germany, Hungary, Italy, Netherlands, Poland, Portugal, Slovenia, Spain, Sweden and the United Kingdom), whilst three responses were also received from Switzerland and Norway. The distribution of responses by country of residence or establishment is shown in Figure 2-2. The largest number of responses were from France, which contributed seven responses (20% of the total).

Figure 2-2: Distribution of the responses by country of residence/establishment

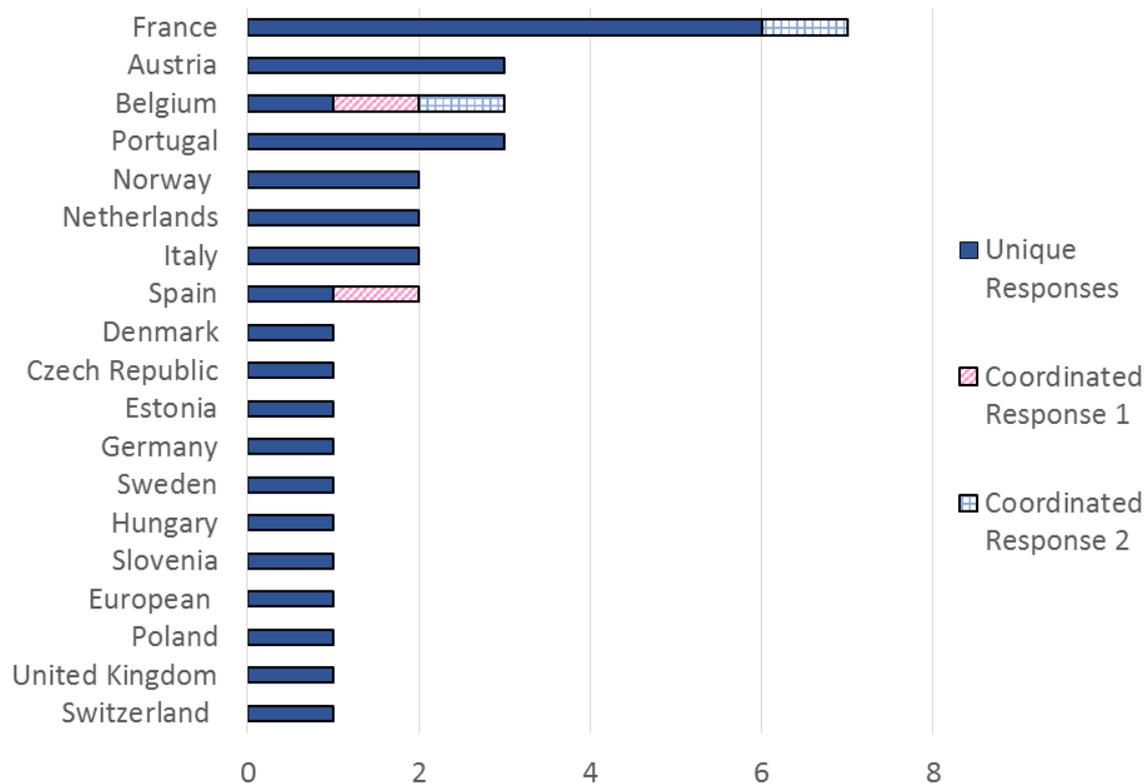
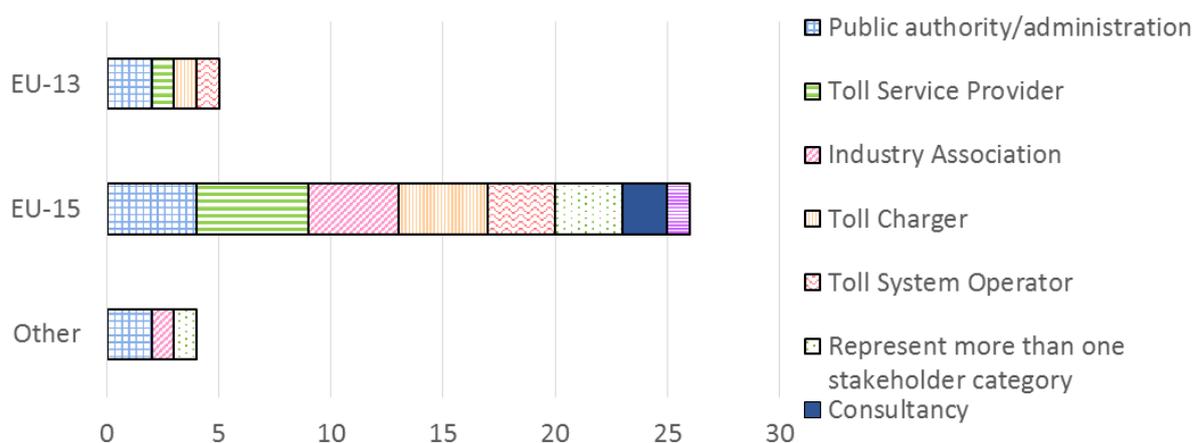


Figure 2-3: Distribution of responses (split by respondent category) by EU-15 and EU-13 membership



When survey response is split by EU-15 and EU-13 membership, as in Figure 2-3 it is apparent that the majority of responses are from EU-15 Member States, with 74% of responses being from these States. Therefore, conclusions drawn from this analysis may be biased towards the views of respondents from these Member States.

2.2.2 Results

Results from the survey are presented and discussed below. Each section below covers a different topic of the subject matter, and each sub-section represents one question from the original survey.

2.2.2.1 Coverage by the Service

Respondents were asked two questions about the current legislation in place requiring EETS providers to offer the service to clients in all EETS domains within 24 months from their official registration in their State of establishment. The issue of prioritising which domains to offer if this obligation were to be removed, with EETS not being offered in peripheral markets, was also discussed. Additionally, they were asked about their preference in relation to a number of potential solutions to the problem. Analysis of the responses to questions asked are presented below.

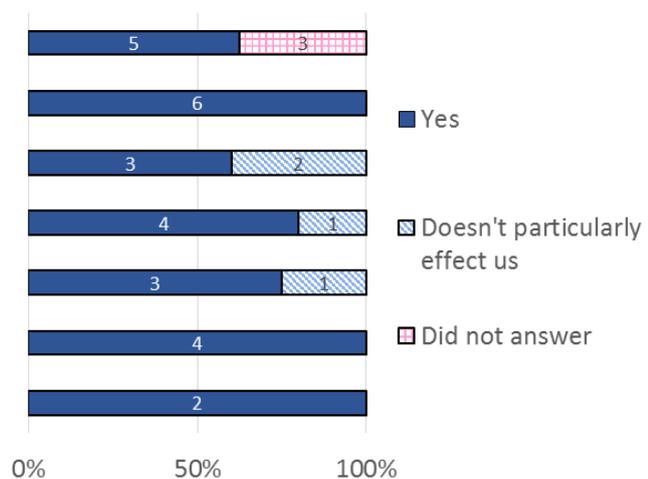
Question 1: Do you agree that the above-described requirement for EETS providers is a problem? If so, please give examples of its negative effects.

Out of all respondents asked, a strong majority (77%) felt that the requirement for EETS providers to cover all domains within 24 months is a problem, as shown in Figure 2-4, while 12% stated it didn't particularly affect them and 11% didn't answer. Not one respondent that answered this question disagreed that this issue is a problem.

Figure 2-4: Survey response on whether respondents agreed that the legislation for EETS providers to cover all domains within 24 months is a problem.



Figure 2-5: Survey response on whether respondents agreed that the legislation for EETS providers to cover all domains within 24 months is a problem, disaggregated by stakeholder category.



When disaggregated by stakeholder group, as shown in Figure 2-5, no significant variations of opinion were identified. Unsurprisingly, the only respondents that felt the problem of full EU coverage within 24 months did not affect them represented toll infrastructure operators/chargers and industry associations.

Respondents were free to provide additional comments about the question and examples of its negative effects if they wished and these responses are summarised below.

Several respondents (14) indicated that the requirement to achieve full EETS domain coverage within 24 months of initial registration is very difficult, if not impossible, to achieve, for a number of reasons. For example, an Austrian public administration (Austrian Ministry for Transport, Innovation and Technology) indicated that the accreditation process for even one toll domain is a lengthy process, and achieving full coverage within 24 months would be impossible. In fact, a Czech toll service provider suggested that, in their experience, the quantity and complexity of the paperwork limits workload capacity to only five toll domains at a given time. Part of the identified issue is the need for EETS providers to gain approval certification from individual Member States, each of which assesses interoperability elements in their own way. This makes the process unnecessarily burdensome for EETS providers and Member States alike. They suggested a system of mutual recognition as a potential solution to this problem, whereby there is only one recognised procedure to assess interoperability, so if approval is gained in one Member States, other countries respect that accreditation.

Generally, the experiences of the survey respondents indicate that the 24 month time-frame is unrealistic. The Austrian toll charger ASFINAG is in the process of carrying out acceptance procedures (including implementation and Suitability for Use tests) for six service providers in the Austrian Toll Domain. This process is expected to be completed in early 2017, but has been ongoing since 2014. Clearly, gaining approval and accreditation is a lengthy process, making achieving the full coverage of EETS domains within the time-frame extremely difficult. This is thought to act as a barrier to entering the market by some. Finally, even the above assumes the on-time delivery of documents and that there are no unforeseen barriers that must be overcome by EETS providers in the time-frame. For example, a Czech toll service provider indicated that in Poland there has been new legislation prepared for opening the EETS market to other toll service providers, but it is not yet feasibly possible to start even the preparation of the necessary documents since the specification of the EETS domains remain uncertain.

In addition, 12 survey respondents felt that the requirement to achieve full coverage of EETS domains is not necessary. For most vehicles within the European Union, a European-wide EETS coverage from one provider is not necessary, since most hauliers limit their operations to around 10 Member States at most. Whilst some respondents (four) did understand the concerns that by leaving the extent of EETS to be driven by the market there is a risk that peripheral countries (small and geographically peripheral) would be left without the service, they still felt that the demand in these areas was not proportional to the investment required to provide them with the service. For example, the Portuguese toll service provider Via Verde Portugal indicated that Portugal, as a geographically peripheral Member State, has limited numbers of foreign vehicles in circulation, including heavy-duty vehicles. Therefore, these regions do not see enough demand for an EETS system to be profitable and therefore coverage may be an unnecessary requirement. In addition, it was felt by the French toll service provider Axxès that the definition of what is peripheral will change through time. For example, currently Greece is considered a peripheral Member State. However, the introduction of new tolling systems in Bulgaria and if third-party countries such as Turkey freely implement the EETS legislation, then Greece's role would become more central. At this point, market demand would require fuller coverage of these Member States, and the service should be provided. Instead, a number of respondents (eight) favoured reducing this scope to a limited number of Member States, mostly suggesting the country of establishment and neighbouring countries would be a reasonable compromise. Indeed, it was felt the full coverage requirement would act as a deterrent towards the establishment of national or regional-level EETS providers, since so few companies would be able meet these criteria. One public administration and toll charger in fact felt that this would lead to a quasi-monopoly across the European Union.

Question 2: Please indicate your preferred solution to the problem (from the list above or other) and explain why. Please also rank the solutions considered according to your preference (1=preferred solution).

Respondents were asked to both indicate their preferred solution to the problem, as well as rank the potential solutions on order of preference. A total of 28 respondents participated in this process. They

represented various stakeholder groups, but the largest was toll service providers (six respondents) followed by toll chargers (five respondents). Out of the 28 respondents, almost half (45%) agreed with the solution to completely remove the requirement to cover all EETS domains within 24 months, as shown in Figure 2-6. 21% felt that replacing the requirement with one to cover certain regional EETS domains whilst allowing the coverage to be completed through partnerships with other EETS providers would be the best, whereas the least preferred solution was to replace the requirement to provide the service in the country of registration and all neighbouring countries, where only 5% of respondents agreed.

For the ranking analysis, a points system was developed, awarding various scores (one-six to each of the six solutions) according to each respondents ranking. A zero was given to any solution not given a ranking. Results were gathered in terms of total scores for each solution and plotted as relative percentages, as shown in Figure 2-7 below. Due to the differing number of ranks given by each respondent (some ranked all six solutions, others only one or two) average scores are not included in this report.

Figure 2-7 below shows that when the solutions were ranked, the option to completely remove the requirement to cover all EETS domains within 24 months was still most supported (29%) as in agreement with Figure 2-6. A slightly larger percentage weighting was given to providing the service in the country of registration and all neighbouring countries when ranked (13%), however this solution was still low in list of preferences from respondents. When analysed by stakeholder group, no clear relationship existed between the most preferred solutions; views varied between all the different groups.

Figure 2-6: Survey response on the preferred solution to solving the EETS coverage problem

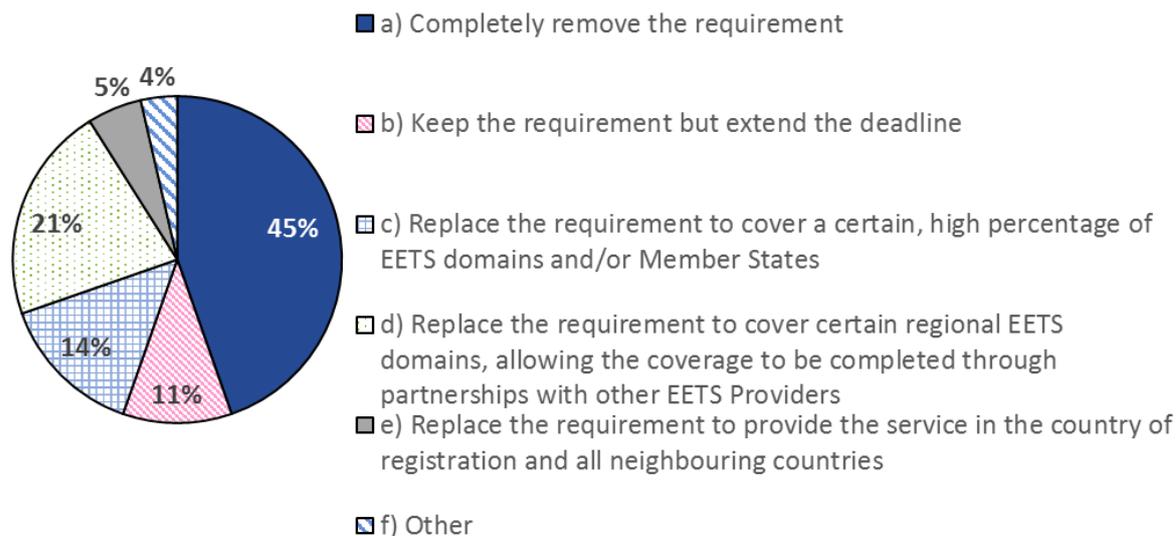
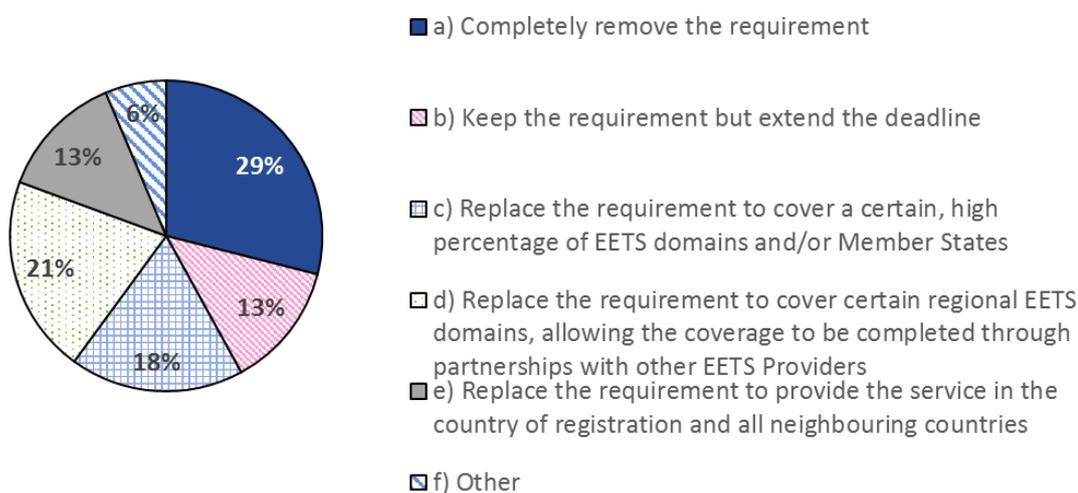


Figure 2-7: Survey response on the solution to solving the EETS coverage problem, ranked according to preference.



Respondents were free to provide additional comments about the question and examples of its negative effects if they wished, and these have also been analysed. Three respondents (a French public authority, the French toll service provider Axxès and the French toll charger ASFA) indicated that the timeframe of 24 months for EU wide coverage for EETS providers is unachievable and should be extended (e.g. to five years), but that it is an important long term goal and the full coverage should remain. This is because it is a leverage to ensure: interoperability is taken into account in the design of new tolling systems; interoperability is implemented in existing tolling systems; reasonable demands are made on both side (roll chargers and service providers) when discussing interoperability; all service users get the same level of service whatever their country of origin. Two respondents representing the Belgium Industry Association AETIS and the Italian toll charger AISCAT stated that the principle of offering a seamless service all over EU is good, but it should be left to the market with regards to timeline and how fast they can do it rather than it being regulated. The completion of the requirement should be dependent on the readiness of all toll chargers. Finally, the Austrian toll charger ASFINAG also commented that the EU should provide funding to accelerate the implementation of EETS compliant services and simplification through toll charger cooperation.

2.2.2.2 Ensuring the Fair Functioning of the EETS market

Respondents were asked two questions about the issues to do with the fair functioning of the EETS market, various issues and the potential solutions. Analysis to responses are discussed below.

Question 3: Do you agree with the description of the problem of discriminatory/unfair contractual conditions for EETS providers? Please provide concrete examples of EETS domains where such conditions are applied.

This question was mainly of relevance to EETS and other toll service providers. While some respondents explicitly agreed with the description of the problem, others thought that it was too strongly stated for the situation in some countries, e.g. in France, Austria and Portugal.

Suggested examples of discriminatory or unfair contract conditions, included:

- In Italy, where the national service provider gained an unfair advantage due to the technical standards used, as the norm used was too vague to be the sole source of knowledge. It took a long time to gain access to the full documentation.
- In Austria, the remuneration for service providers is almost similar to those for card issuers, whose 'only' role is to commercialise the OBU of the national service provider. The costs of interoperability (including adaptation of OBU and interfaces) are therefore not taken into account.

- In Belgium, the remuneration as a service provider is only slightly higher than the one given by the national service provider to card issuers who are commercialising their OBU. Once again, the benefits of having various service providers is undervalued.
- In Poland on the A4, an OBU is offered by a toll service provider, whereas the acceptance of additional OBUs has been refused, as the system was not yet ready to accept other OBUs.
- Is it not yet defined if and what kind of remuneration will be paid in Germany and Belgium.

A toll service provider argued that a free, fair, non-discriminatory competitive market cannot be achieved if there are entities that vertically integrate toll charger, toll operator and toll service provider functions. Abertis argued that the Directive should leave no room for Member States to transpose the Directive differently, while a simplification to the legal framework could be achieved by establishing a single European authority to oversee electronic tolling.

It was also noted that the problems were not limited to service providers as the involvement of EETS providers led to increased risks and costs for those operating 'Build, Operate and Transfer' models, while at the same time EETS providers were not guaranteed returns on investment when involved in such schemes.

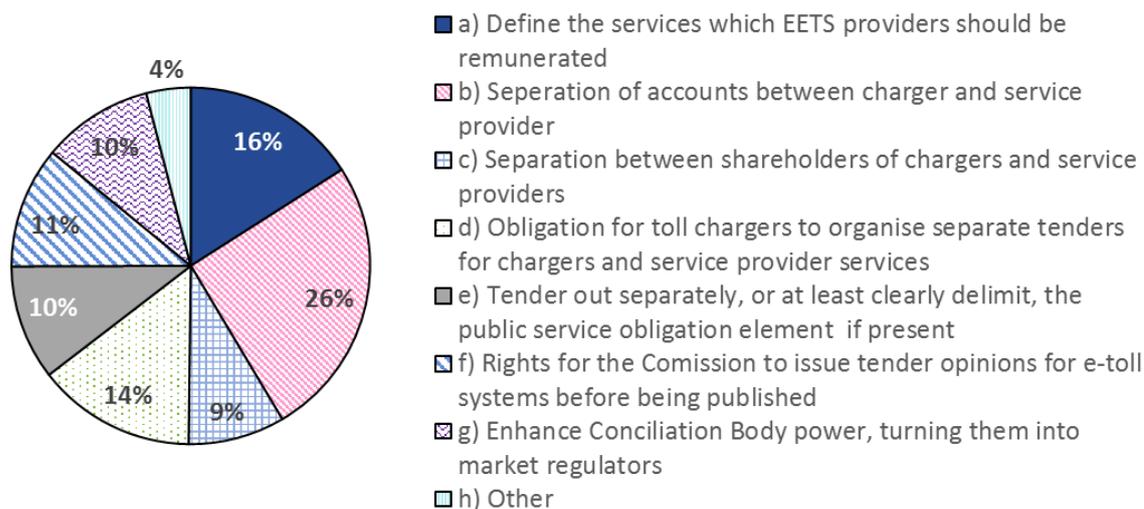
Other respondents argued that some of the proposed solutions were not necessary, e.g. solutions e) and f), as these risk undermining the goal of interoperability, or, in the case of f), were not viable as it risked breaching confidentiality and procurement laws (See Figure 2-8 below for a definition for each option). A Dutch Ministry was not convinced that some of the solutions were needed, e.g. b), c), d) and e), while they disagreed completely with others, i.e. f) and g).

In addition to the solutions proposed in the question, other ways forward were also suggested, including:

- Separating the role of toll operator from toll charger and service provider, as in France and Spain.
- Remuneration should cover each task separately, i.e. there should be a remuneration component for toll charger tasks and a separate remuneration component for service provider tasks.
- Legislation should define a minimum set of services common for all EETS service providers, which should be subject to an acknowledged level of remuneration.
- The scope of the conciliation body should cover all types of scheme for toll payments.
- As a minimum, EETS providers should receive equal remuneration for the same service as local providers and should have the same ability to offer local discounts.
- Making it mandatory that a toll charger should provide service provider functionalities in order to provide for local customers and those with low credit ratings.

Question 4: Please rank the solutions listed above according to your preference (1=preferred solution) and explain your choices.

Respondents were asked to rank the potential solutions to the problem of discriminatory / unfair practices for EETS providers in order of preference. A total of 22 respondents participated in this process. Most were from toll service providers (six respondents) followed by toll system operators (four) and toll chargers (four).

Figure 2-8: Survey response on the solution to solving the unfair EETS market problem, ranked according to preference.

For the ranking analysis, a points system was developed, awarding various scores (one-eight to each of the eight solutions) according to each respondents' rankings. A zero was given to any solution not given a ranking. Results were gathered in terms of total scores for each solution and plotted as relative percentages, as shown in Figure 2-8. Due to the differing number of ranks given by each respondent (some ranked all eight solutions, others only ranked two or three) average scores are not included in this report.

Figure 2-8 shows that the most preferred solution (26% of total responses) for solving the problem of unfair EETS markets was (b) to have a strict separation of accounts between the toll charger and toll service provider. This was followed by option a) defining in the legislation the services for which EETS providers should be remunerated by the toll charger (16% of total responses). The solution that was least supported was strict separation between the shareholders of toll chargers and service providers. When analysed by stakeholder group, no clear relationship existed between the most preferred solutions. However, both toll operators and industry associations were more in favour of the separation of accounts (75% and 67% respectively) compared to others.

Respondents were free to provide additional comments about the question if they wished, and these have also been analysed. A range of comments were provided on the specific issues regarding the potential solutions. Two toll system operator respondents (VINCI Concessions and the Austrian tolling system operator) stated that option (a) (defining the services which EETS should be remunerated) would complicate potentially more efficient tailored offerings, and that it was already addressed by the separation of accounts and fair remuneration. Solution (b), the separation of accounts between shareholders, was also described as indispensable but already implemented, whilst (c), the separation between shareholders of chargers and providers, was thought to be unfeasible. Opinions were mixed with regards to option (d) (toll chargers organising separate tenders for services); one Czech toll service provider stated that this separation may help them in some cases but that it does not resolve the issue of vertical integration and its associated risks, while the French system operator VINCI Concessions said it would complicate tailored offers, similar to option (a). Option (f) (rights for the Commission to issue tender opinions for systems before being published) received a number of comments: the Austrian ministry for Transport, Innovation and Technology did not recommend it at all, while the Austrian system operator stated that public procurement is a national issue and should be handled by the judiciary. One respondent (the French system operator VINCI Concessions) questioned EU competence for technical and operational aspects of tenders as well as the timing of these, along with a UK consultancy respondent who concluded that a consultation step would be useful but the concern would be that it would delay the procurement process. Additionally, a Czech toll service provider stated that this solution is only a partial solution to the problem with a necessity of heavy oversight for integrated market players.

Finally, two respondents on behalf of French and Belgian industry associations (TMS and AETIS) could not rank the solutions as saw interdependency between some of them.

2.2.2.3 Reducing the cost of electronic tolling and of the EETS

Respondents were asked five questions about the excessive cost of electronic tolling systems, which are currently developed largely from brand new architecture as opposed to using existing successful models. As previously, respondents were also given potential solutions to be considered that would address the problem. A summary of the discussion received for each question is presented below.

Question 5: Please give your opinion on the existence and precise nature of the problem described above.

While some respondents implicitly agreed with the problem as stated in the question, others were not as convinced that intervention was needed. It was also noted in relation to the example given in the introductory text, that Belgium is not the only example of cooperation between different regions on tolling, as the EasyGo project aims to do this involving a number of different countries and regions.

In addition to the solutions proposed in the question, other ways of reducing costs were proposed, including:

- Parts of the accreditation process to be made common for all toll chargers, and that this should be performed only once and acknowledged by all.
- Use of a common platform with a common interface, such as the EasyGo Hub developed within the project of the same name.
- Allow OBUs used in EETS systems to be used in non-EETS systems.

A couple of respondents argued that cooperation and interoperability should be market decisions rather than being imposed, whilst acknowledging that harmonisation has the potential to lead to cost savings. With respect to standardisation, some respondents believed that the standardisation of the technical elements was crucial, while others were not convinced of the need for further technical standardisation arguing that the existing standards are sufficiently mature, but that harmonisation should be delivered by being clear in legislation which standards should be complied with. It was also noted standardisation should not prevent innovation, so it was suggested that the EU could usefully focus on performance standards rather than technical standards. XEROX argued that the number of standards that existed meant that it was easy to comply with standards, and still not deliver interoperability, implying that there were already too many standards.

ASFA argued that only the toll charger could be responsible for defining and checking accreditation procedures. It was also noted that harmonisation itself could lead to additional costs, if new technologies are required, which are more expensive. Another respondent noted that cooperation between toll chargers and the reuse of existing business practices will help to reduce the costs of the systems.

One respondent outlined three issues. First, the accreditation processes differ from one domain to another, whereas there is some scope for mutual recognition so that some elements of the process need only be undertaken once. Second, toll chargers understandably want to be responsible for the rules applied in their toll domain, but they are not willing to take account of rules applied by other toll chargers. Third, as there is room for interpretation in any standard, service providers should be consulted at the earliest possible stage to avoid unnecessary costs.

Question 6: Please specify, to your best knowledge, examples of local specificities to electronic tolling systems which increase the setup and/or operation cost of the schemes, or constitute obstacles to the provision of EETS in the concerned toll domains. What are the most problematic elements (too restrictive KPIs , requirements stemming from differing national data protection rules, classification of tolls as charges or taxes, model of relationship between the toll charger and the EETS provider – 'reseller' or 'agency', lack of clear remuneration of EETS, risk cover when EETS is in charge of the toll calculation, other)? Please provide concrete examples, supported by background information and figures

This question was mainly of relevance to EETS and other toll service providers. A number of examples were provided that increased the set up and/or operational cost of schemes, including:

- That the level of remuneration for GNSS-based e-tolling systems is not higher than that for DSRC technology, so it does not reflect the higher level of responsibilities and risks that are placed on service providers by GNSS-based e-tolling systems.
- The substantial bank guarantees that have to be issued by the service provider to each concessionaire, e.g. in France.
- OBU certification and back-office platform development are costly.
- The quality of the customer service, not just the cost of that service, also needs to be considered.
- The 'agent model' limits the opportunity for the EETS provider to offer their own services in conjunction with EETS, e.g. fuel and drivers' expenses made by credit card, VAT services, etc. This model also sometimes requires the toll service providers to obtain a financial institution licence in order to operate.
- Accreditation procedures that are specific to toll domains and are often unpredictable, can increase costs.
- The complexity of VAT rules in some countries.
- Lack of adherence to standards, e.g. on roadside equipment.
- Different registration requirements.
- Many different toll chargers in a single country.
- In Italy, which uses UNI1 DSRC technology, its many small concessionaries are not ready for processing the certification of OBUs from various service providers.
- The use of a hub approach would bring additional costs to toll chargers that are already able to send billing details directly to EETS providers within a DSRC-based toll domain.

Question 7: Please specify, to your best knowledge, examples of local specificities which constitute obstacles to interoperability, but are objectively justified by local characteristics or law.

This question was mainly of relevance to public authorities, toll chargers and toll system operators. No local specificities were identified that constituted a barrier to interoperability, although some general obstacles were identified, including where:

- National legislation and regional agreements gave discounts for certain users.
- Local charging rules require information that toll service providers do not usually provide.
- A toll charger chooses additional parameters that have to be supported by the OBU, making it more complex.
- Charges differ depending on the type of fuel, which is not supported by EN15509.
- The fitment of an OBU is mandatory for all vehicles in the absence of a mature EETS market.

Furthermore, a wider obstacle was reiterated, i.e. that an OBU certified in one Member State needs to be recertified in all EU Member States.

Question 8: What are the main reasons preventing Member States/toll chargers from co-operating in the deployment of electronic tolling schemes? Are they mainly political (questions of national sovereignty over toll collection systems), legal, administrative, economic or other in nature?

This question was mainly of relevance to public authorities and toll chargers. A number of respondents argued that there was nothing preventing cooperation on the deployment of electronic tolling systems and that this had been successfully achieved within some Member States and between different domains in different countries. Others put forward a variety of reasons, including that:

- A toll system needs to be designed in the best and most efficient way for the infrastructure it is being designed for, so that it was a question of efficiency more than national sovereignty.
- It was a question of national sovereignty in some countries.
- Different national and local circumstances lead to different business cases in different toll domains, which suggest a specific system.

- Such coordination requires a lot of effort from a lot of different stakeholders, which needs resources particularly for cooperation between domains from different countries.
- Extending a system to a neighbouring country is challenging as a result of the complexity of tender legislation and procedures, which are also subject to the constraints of political cycles.

Question 9: Please rank the solutions listed above according to your preference (1=preferred solution) and explain your choices, including references to concrete examples, data and information

Respondents were asked to rank the potential solutions to the problem in order of preference. A total of 20 respondents participated in this process. Most responses were from toll chargers and service providers (10 respondents).

For the ranking analysis, a points system was developed, awarding various scores (one-five to each of the five solutions) according to each respondents ranking. A zero was given to any solution not given a ranking. Results were gathered in terms of total scores for each solution and plotted as relative percentages, as shown in Figure 2-9 below. Due to the differing number of ranks given by each respondent (some ranked all five solutions, others only ranked two) average scores are not included in this report.

Figure 2-9: Survey response on the solution to reducing costs of electronic tolling and of EETS, ranked according to preference.

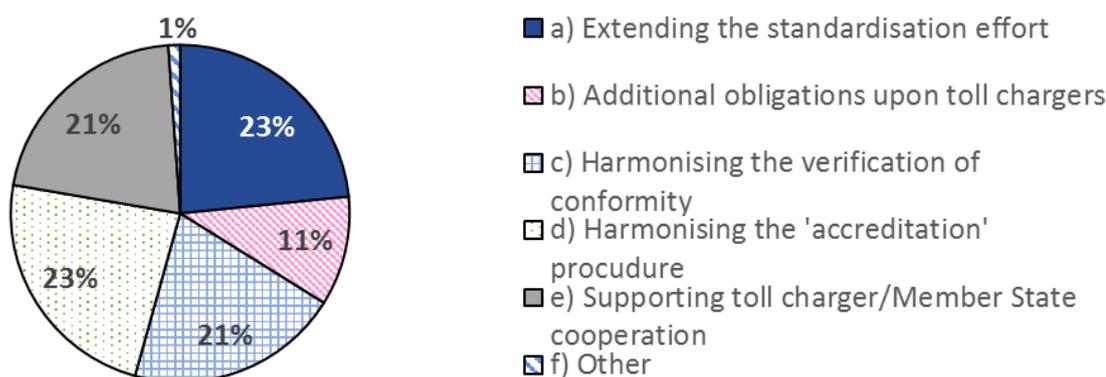


Figure 2-9 shows that the most preferred solutions (% of total response) for solving the problem of high costs related to electronic tolling and EETS were both (a) extending the standardisation effort by developing more profiled standards and thus harmonising tolling schemes to a greater degree and (d) harmonising the procedure of 'accreditation' of the EETS provider to a toll domain. The least supported solution was (b) putting upon toll chargers additional obligations in their relations with EETS providers, such as the obligation to provide electronic maps in GNSS -based schemes, or to support the handling of EETS providers through a harmonised application profile.

When analysed by stakeholder group, no significant findings existed between the most preferred solutions. However, it was found that toll service providers were most in favour of both solutions (a) and (d), whereas no public authorities/administrations were.

Respondents were free to provide additional comments about the question if they wished, and these have also been analysed. A range of comments were provided on the specific issues regarding each potential solution. Some respondents (four representing public authorities, consultancies, toll service providers and toll system operators) commented on the positives of option (a), where extending the standardisation effort might prove a significant step forward in the case of newly launched systems. On the other hand, another three respondents representing toll system operators and public authorities disagreed with this solution, stating that current systems already reflect a respectable level of standardisation and can be made interoperable, so there is no need for further standardisation or harmonisation. A UK consultancy proposed that the work of standards committees should be overseen by practitioners (i.e. toll chargers and EETS providers). A body representing toll chargers should appoint

a small team of experts to derive a harmonised approach based on the standards which already exist, and provide guidelines/application profiles for how these standards should be applied.

Four respondents, who represent ministries, consultancies, toll service providers and system operators, commented on supporting option (b) (additional obligations upon toll chargers in their relations with EETS providers e.g. providing electronic maps in GNSS-based schemes). They stated that this is very important, toll chargers should be responsible for specifying and providing toll context data in an unambiguous electronic data format, and there could be some benefit from a harmonised application profile which would be created. Two respondents from public authorities/administrations highlighted their disagreement for this solution, and that any of the other solutions are more appropriate to address the problems. A UK consultancy suggested that perhaps this solution should only apply to those toll chargers which have implemented a GNSS based ETC system.

Respondent's opinion about option (c), harmonising the verification of conformity, were again mixed. The Austrian system operator believed there is no need for further harmonisation, and a UK consultancy felt it could not be done without prior work under solution (a) as discussed above. The Norwegian public authority NRPA felt the focus should be on ensuring interoperable communications between systems, and Kapsch Traffic Com concluded that rules should be harmonised while certification could still be done at national level. Harmonising the 'accreditation' procedure of EETS providers to a toll domain (solution (d)) was supported by a UK consultancy, but again believed to be unfeasible without prior work under solution (a).

Three respondents (representing public authorities/administrations) commented on the support for option (e), supporting toll charger and Member State cooperation. They believed cooperation is the key to harmonisation thus lowering legal and administrative barriers, it can ease acceptance procedures for all parties involved, and EETS requires cooperation at EU level in order to ensure its implementation progresses and to prevent continued divergence of technical approaches. Two respondents (a toll service provider and the Austrian toll system operator) disagreed with this solution, stating it already exists and additional activity will offer little added value. Finally, the toll service provider XEROX highlighted the equal importance of all solutions.

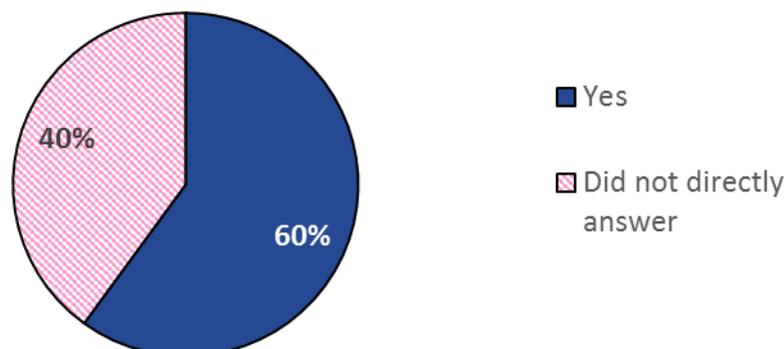
2.2.2.4 Costs of the Lack of Interoperability for Road Users

Respondents were asked one question about the negative costs and consequences experienced by road users due to the current lack of interoperability, including multiple OBU costs, additional administrative fees, fines and installation costs. Analysis of responses for this question is presented below.

Question 10: Do you agree with the above description of the problem? Please support your answers with concrete examples, figures and statistics.

This question was of most relevance to haulage companies and road transport associations. Out of the 10 respondents that contributed to this question, 60% strongly agreed about the fact that negative costs and consequences are experienced as a result of a lack of interoperability, as shown in Figure 2-10. There were no respondents that disagreed with the problem described.

Figure 2-10: Survey response to whether respondents agreed to the problem of negative costs due to lack of interoperability.



Analysis of explanation/additional comments highlighted the strong agreement with regards to negative costs arising due to a lack of interoperability. For example:

- The French toll service provider Egis Easytrip Services agreed that the absence of interoperability has, from the point of view of transport companies, increased costs in terms of multiplication of OBUs, invoices, service fees and fines.
- Another toll service provider agreed that one of the biggest issues for truck haulage companies is managing the numerous OBUs, their distribution and collection, which also presents a hidden cost reflected in the time and money spent by employees of the toll service providers.
- A UK consultancy felt the current situation to be outdated and inconsistent with technology that is readily available. The requirement to register separately in every country or even every toll domain actually discourages users from using toll roads.
- APCAP, a Portuguese respondent representing an industry association stated that some of their affiliates' customers report many of the problems mentioned.
- Another industry association discussed the issues with their members transporting goods through Europe (especially from Norway to Italy and to the UK). They experience administrative costs, including having five or more different OBUs behind the windscreen, due to the many different models for road charging systems in place across different Member States.
- A French road user (representing Fédération Internationale de l'Automobile) highlighted the issue for motorhome users when interacting with the current tolling systems; unfair, undue hassle can result for users of these vehicles. For example, tolling systems which use physical vehicle measurement as a means to differentiate between cars and lorries can be problematic and/or costly due to differing measurement thresholds and price brackets.

The Portuguese respondent Via Verde Portugal (a toll service provider) believed that with proper regulation and standardisation in place, using DSRC as a common technology (even if combined with GNSS) is the solution to avoid excessive road user costs. On the other hand, two respondents representing industry associations (ASECAP and SEOPAN) felt that interoperability is in itself a product with costs, and so additional costs will exist even with higher interoperability of tolling schemes in the EU.

2.2.2.5 Cross-border Enforcement

Respondents were asked four questions on the topic of cross-border enforcement and toll evasion of foreign-registered vehicles. Analysis of responses are summarised below.

Question 11 Please indicate (and quantify to the possible extent), on the basis of your experience, the extent of the problem of toll avoidance by foreign registered vehicles,

as compared to locally registered ones. Please differentiate between different kinds of vehicles (trucks, buses, light vehicles), different types of tolls (free flow, with barriers open/closed, vignette – paper/electronic), different types of roads, etc. What are, in your opinion, the main reasons for the violations (lack of awareness, specific difficulties in registering, lack of willingness to pay, other)? What solutions did you develop to limit the fraud? Which of these have proven to be efficient and which not?

This question was mainly of relevance to public authorities, toll chargers and toll system operators. Estimates in relation to the extent of the problem of toll avoidance by foreign-registered vehicles were provided by some respondents, including:

- In Poland, 38% of identified infringements in relation to toll collection concerned foreign-registered vehicles. Eighty per cent of toll-related infringements concerned vehicles over 3.5 tonnes. There is only a free-flow electronic toll system in place in Poland and it is considered that toll avoidance is usually connected with lack of awareness.
- In Portugal, in 2015 25% of toll evasion was by foreign-registered vehicles, with 78% of these coming from Spain and 62% of these being heavy duty vehicles.
- In Italy, it was considered that in general toll avoidance was intentional, but no data on the level of avoidance was provided.
- In France, the proportion of toll evasion by non-domestic vehicles is 40%, which increases to 60% for some toll domains that are particularly vulnerable to cross-border traffic. The proportion of foreign-registered vehicles has increased recently, as a result of legislation that has reduced the number of toll evasion cases by domestic vehicles by nearly 80%.
- In Sweden, it is considered that the vast majority of foreign-registered vehicles pay the tolls.
- In Austria in 2015, there were 108,000 tolling offences by foreign-registered vehicles under the HDV toll, which was 89% of the total number of tolling offences that year. For the light-duty vignette, 117,000 cases – 63% of the total – were attributed to foreign vehicles.
- In Slovenia, it has been observed for the vignette tolling that there are more violations amongst foreign-registered vehicles than amongst locally-registered vehicles, whereas there is no noticeable difference in toll evasion between foreign-registered and local HDVs. It is considered that the main reason for not paying is an attempt to avoid payment, as a result of expectations of an inability to enforce toll recovery across borders.

Question 12: Should the exchange of information, between Member States, on the identity of toll offenders be mandated by EU law, as is the case for road safety related offenses? Is the answer the same irrespective of the type of toll, of its classification in national law (charge or tax) and of the type of vehicle concerned? What should be the modalities of this exchange (e.g. should private toll chargers have access to such a system, or should the latter be limited to public authorities?)? What are the pros and cons of such a solution?

Respondents generally agreed that the exchange of information between Member States on the identity of toll offenders should be mandated by EU law irrespective of the type of toll or vehicle, rather than being left to bilateral agreements. It was also suggested that the EU should also negotiate suitable arrangements with neighbouring countries. Various respondents agreed that the approach taken by the cross border data exchange relating to road safety offences was a good model, or at least a good starting point, for developing a system for the enforcement of toll evasion.

There were fewer views as to the modalities for exchanging information. Some respondents suggested that this could be Member State to Member State with the information then being transmitted to the toll charger. It was noted that cooperation between Member State authorities is already beginning in this respect, e.g. between Austria and Germany. Other respondents suggested that there should be some sort of EU database, such as an EU vehicle registration database or a central debt information system, containing the relevant information, or alternatively that direct access to national vehicle databases should be allowed. A Swedish public authority suggested that the obligation to share information should be at the point where a vehicle has been identified as having to pay a toll; three respondents suggested extending the European Vehicle and Driving Licence Information System (EUCARIS) to cover tolls. It

was noted that with EETS the situation would become more complicated as the customer would be unknown to the toll charger, so a strong cooperation between the toll charger and the service provider would be required.

There was however disagreement in relation to whom should have access to this data with many stating that it should just be public authorities as a result of privacy concerns, although others argued that private operators should also be able to access this information in order to allow them to fulfil their role.

The benefits of the such an exchange of information were considered to be lower rates of toll avoidance and, as a result, a fairer treatment of road users who paid their tolls and a reduction in unfair competition, as well as an increased budget for maintenance if revenues were used for this purpose. If the system was not supported by an automatic exchange of data it could be costly, while if the cost of collecting the avoided toll could not be covered it would be of limited value.

A UK Consultancy noted that identifying whether enforcement was needed could be a challenge. If the presence of an OBU is not registered, it could be the result of a faulty OBU or the absence of an OBU. In order to identify whether the driver had an EETS account or not, a request would need to be made to all EETS providers, which may not be willing to or even allowed to share such information.

It was also suggested by several respondents that user obligations be standardised across the EU and that these be kept as simple as possible. Other respondents believed that action should be taken in addition to the exchange of information in order to build a realistic enforcement system that guarantees payment of the avoided toll as well as the associated fines.

Question 13: Does differing national law relating to the protection of personal data impede the cross-border enforcement of toll payments?

In total 24 stakeholders responded to this question. As shown in Figure 2-12 46% (11 respondents) felt that differing national laws relating to the protection of personal data impedes the cross-border enforcements of toll payments. 16% of respondents did not think this was the case, 17% could not answer due to lack of knowledge, and 21% did not directly answer. When disaggregated by stakeholder group, as presented in Figure 2-11, no significant variation of opinions was apparent. Respondents representing toll chargers and public authorities were most strongly in agreement about the problems associated with data protection in relation to cross-border toll enforcement.

Figure 2-11: Survey response to whether differing national law relating to the protection of personal data impedes cross-border enforcement of toll payments, disaggregated by stakeholder category.

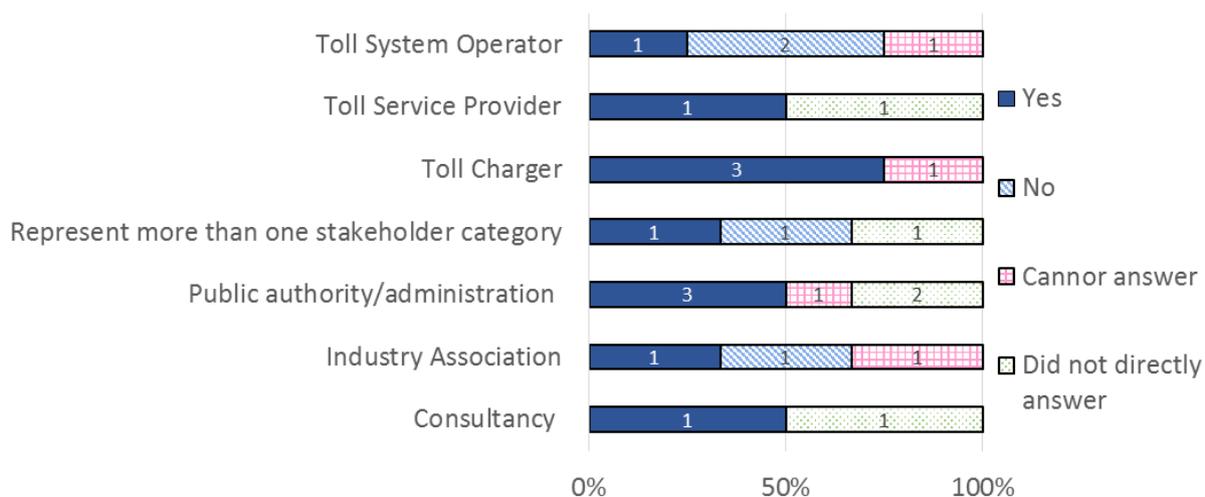
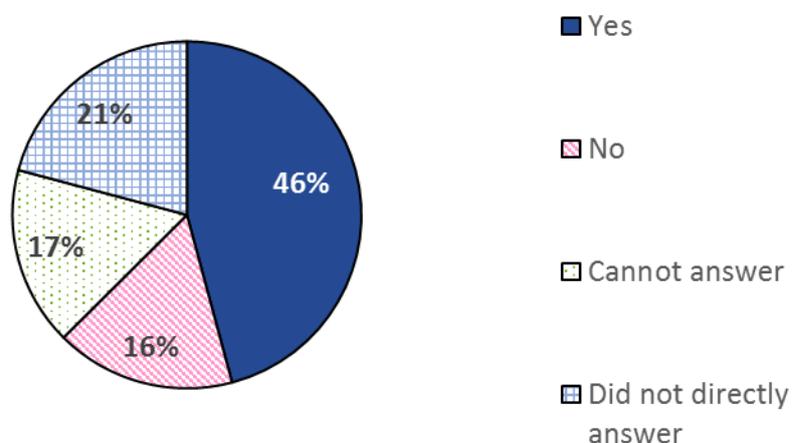


Figure 2-12: Survey response to whether differing national law relating to the protection of personal data impedes cross-border enforcement of toll payments.



Of the 24 respondents, 11 respondents from varying stakeholder groups felt that differing national data protection laws do impede cross-border enforcement of toll payments. While some respondents (three) did not specify this further, others provided some further information.

A Swedish public authority felt it was the case both regarding identification of the person responsible for paying the toll and regarding enforcement after the confirmed fare evasion. Another two respondents (including NRPA) highlighted that information exchange can vary from Member State to Member State due to varying national laws; it is easy to obtain information in some places but impossible or at least very expensive in others. However, it was argued that EU data protection regulation should contribute to more trust and thus future data sharing. Two respondents (a Slovenian toll charger and the Dutch Ministry) stated that the problem is most likely due to the fact that there is no current obligation to share information, and violation of toll payments is not on the list of offences for which EU Member States are obliged to provide data. In most cases where exchange of data is possible, the applicant is most often required to state why, to what end and on which grounds the applicant can (legally) ask for the information. Therefore, an obligation to provide data would greatly contribute to solving the problem (as both a precautionary measure and a punitive policy towards offenders). The Spanish toll charger Abertis also agreed that a strong EU regulatory framework ensuring data protection safeguards, as well as limits for this data usage, would help to tackle the problem.

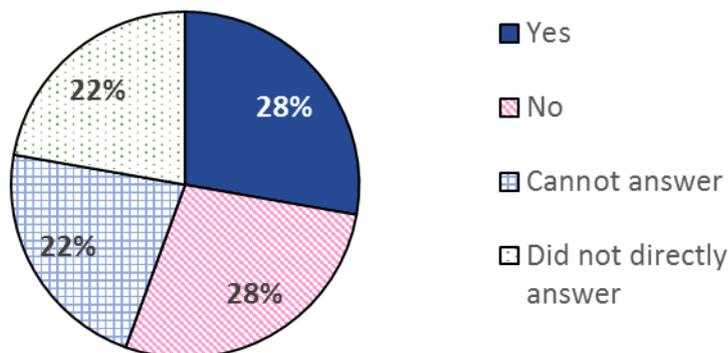
Additionally, a UK consultancy proposed that the main problem relates to the fact that different countries have different legal bases for charging tolls in different toll domains. This means in some countries the toll is simply a form of tax levied by the government, whereas in other countries it is a fee to a public body for using a road which it maintains, or in others a charge levied by a commercial road operator for access to a particular stretch of road. Not paying the toll could be either a civil offence or a criminal offence according to the particular situation and so different basis for the release of data could apply in different situations and in different toll domains.

On the other hand, four respondents (representing toll system operators, industry associations, toll chargers and public authorities) believed that differences in national data protection laws will not impede the cross-border enforcement of toll payments. The industry association respondent APCAP argued that there are no concerns regarding traffic offences and thus do not expect any concerns regarding cross-border enforcement of toll payments either. The Austrian toll system operator mentioned that the enforcement of a levy or a tax is a legitimate concern of the enforcement authority and therefore a legal basis for processing of data is easy to obtain. Others felt that there is no specificity of electronic toll collection regarding personal data protection compared to any other modern payment means, and cannot identify any national obstacle within this that could affect cross-border enforcement of toll payments.

Four respondents (representing toll chargers and system operators, industry associations and public authorities) concluded that they are not knowledgeable enough to make statements about the impact of differing national laws relating to the enforcement of toll payments. The Austrian Ministry for Transport, Innovation and Technology mentioned that there is no experience with national law of other countries related to this. A Hungarian toll system operator was unable to contribute as on no occasion has data been requested from them. They did suggest however that provisions of national regulations should be harmonised with the respective EU Directive. Finally, the Norwegian industry association assumed there is an impact but didn't know enough about the regulations to comment further.

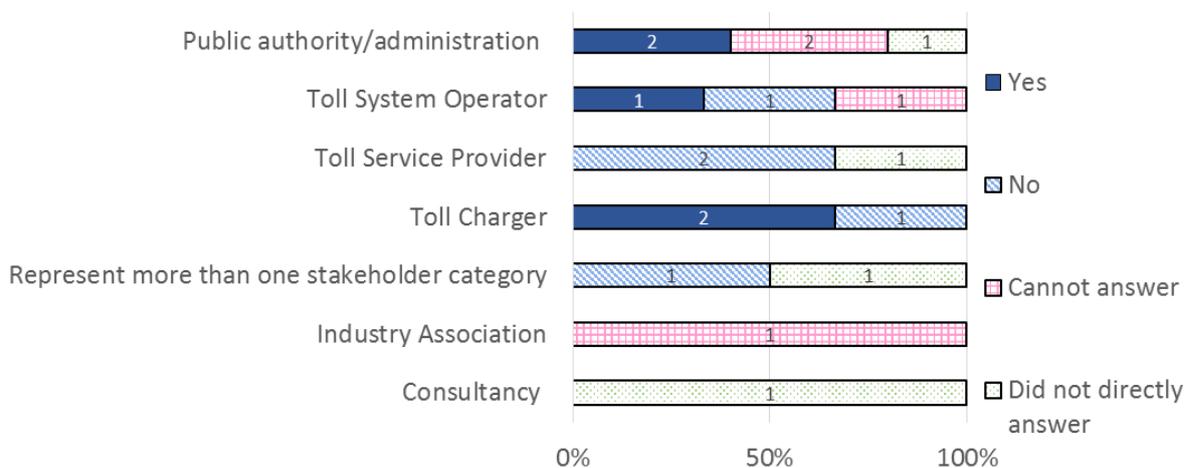
Question 14: Do the currently differing national data protection regimes give rise to difficulties in the design of systems by EETS providers? If so, will the General Data Protection Regulation coming into force in 2018 improve the situation and how?

Figure 2-13: Survey response to whether current differing national data protection regimes give rise to difficulties in the design of systems by EETS providers.



A total of 18 respondents provided an answer to this question and views were mixed, as shown in Figure 2-13. 28% (five respondents) agreed that current differing national data protection regimes give rise to difficulties in EETS providers' system designs, whereas 28% also believed this not to be the case. An additional 22% (four respondents) could not answer and another 22% did not directly answer but provided additional comments. When disaggregated by stakeholder group, as shown in Figure 2-14 no significant differences were highlighted but it can be noted that respondents on behalf of toll chargers and public authorities felt most strongly about these difficulties (up to 67%) whereas most toll service providers disagreed (67%).

Figure 2-14: Survey response to whether current differing national data protection regimes give rise to difficulties in the design of systems by EETS providers, disaggregated by stakeholder group.



Additional comments provided by respondents have also been analysed. Out of the total 18 respondents, several (five representing public authorities/administrations, toll system operators and toll chargers) agreed that difficulties in system design have arisen due to differing national data protection regimes. A Slovenian toll charger believed this is a reason for the difficulties in designing EETS systems but is not the crucial one, and two public authorities/administrations (including NRPA) felt that difficulties cause system complexity to rise (including with the handling of data protection between toll companies and service providers). While two of these respondents stated that planned unification and new common EU data protection regulations would give more equal data protection for Member States, another felt that only time will tell how the Directive will be interpreted and another felt that system complexity will continue regardless.

Other respondents (five representing toll operators, chargers and service providers as well as public authorities/administrations) did not see any problems with current or future (GDPR) data protection laws regarding the design of systems by EETS providers. For example, the Austrian toll service operator stated that as EETS providers have contractual relationships with their customers and processing data is part of those contracts (with the consent of the data subjects), they see no reason why the new GDPR should cause any difficulties.

Other respondents (four representing public authorities/administrations, industry associations and toll system operators) did not have sufficient knowledge, a complete opinion, or experience to answer this particular question.

2.2.2.6 New Technologies

Respondents were asked two questions with regards to new/additional tolling technologies and the feasibility of integrating these into the EETS electronic tolling framework. Responses are discussed below.

Question 15: How could electronic tolling potentially develop over the upcoming ten years? What changes to the EU legislation would be needed to foster welcome market developments in this respect (and, similarly, to protect the market from unwanted risks)?

This question was mainly of relevance to equipment manufacturers, toll chargers, system integrators and toll service providers. Various respondents believed that technology would develop over the coming years, but few gave more details as to how it might develop. XEROX suggested that the next significant technology shift would be towards GNSS-based tolling using smart phones instead of OBUs. Kapsch Traffic Com suggested that one of the immediate challenges was to integrate tolling technologies into

third party devices designed for other applications, such as smart phones, although a further respondent noted that a system using smart phones still needs to be proven, including an assessment of the associated risks. Sund & Bælt Holding suggested that devices that have a unique identity, such as ITS using DSRC 5.9 GHz and/or WiFi, or tachographs including DSRC 5.8 GHz, could be used for charging as they contain the necessary information about the vehicle and so legislation should allow the use of such devices for this purpose. The integration of OBUs with other devices within a vehicle was proposed as a way of reducing the risk of fraud. With respect to automatic number plate recognition (ANPR), some respondents argued that it could be used to complement, but not replace, electronic tolling, while ASFINAG suggested that such solutions were out of the scope of EETS as they do not require an OBU.

It was also underlined that the European Commission needs to be kept informed about technological developments in order that the policy framework promotes innovation rather than imposing artificial conditions. DKV Euro Service GmbH & Co suggested that new technologies should be examined within a dedicated working group and evaluated by a neutral organisation. Other respondents argued that it was premature to change the EETS legislation with respect to the technologies that it allows, and instead EETS should be allowed to be implemented and then evaluated before further action was taken in this respect. A UK consultancy argued that the market should not yet be opened up to other technologies in order to protect the investment in DSRC that has been made in Europe. Prior to its implementation, others argued that a new technology would need to be evaluated to identify the potential benefits that it would bring to the system taking into account the investment needs on the part of the service providers.

It was also suggested that standards for OBUs should allow toll service providers to enhance their devices without the extensive recertification that is currently needed. Egis Easytrip Services suggested that a constraint was the ability of manufacturers to develop integrated on-board technology that was compliant with the necessary specifications. Rather than changes to EU legislation to promote the development of new technologies, some respondents argued that the EU policy framework should focus on developing standards for data, including their collection, secure storage, efficient transmission and protection.

Question 16: Are there other technologies that are proving or may prove to have potential for development in the European market that are worth being considered when revising the EETS legal framework?

This question was mainly of relevance to equipment manufacturers, toll chargers, system integrators and toll service providers. In response to this question, many respondents referred to their answer to the previous question (see Section).

ANPR systems were mentioned by a number of respondents as having the potential to be used as a toll collection technology or as an additional technology to enforce toll collection. Some argued that EU legislation was not necessary at this stage as such systems did not raise interoperability issues in the way that electronic toll collection does, while others argued that EU legislation should cover ANPR in the longer-term.

RFID was also seen as a potentially promising technology that EU legislation could cover in the longer-term. Egis Easytrip Services believed that RFID sticker tag technology would be appropriate for tolling light duty vehicles, while embedded electronic technology, such as DSRC, linked to an account that can be managed through a smart phone, might also be considered for such vehicles. The same respondent believed that “high-end technology”, such as GNSS based OBUs, have the potential to provide multiple benefits for heavy duty vehicles. Abertis argued that the existing multiple tolling systems could be replaced by the use of mobile applications, as a result of the high penetration of smart phones and the good coverage of 3G and 4G networks in Europe, while telematics technologies also have potential in this respect. It was also suggested that fleet management systems could be used for tolling, while video technology capabilities were also improving fast.

Additionally, a number of respondents stated that the question of a dedicated bandwidth for DSRC toll systems needed to be clarified.

2.2.2.7 Light Vehicles

Respondents were asked two questions regarding the difference between heavy duty and light vehicles in terms of the EETS market and adaptations to the EU legal framework. Responses received are analysed below.

Question 17: Please give your opinion on the differences between the EETS markets for heavy duty- and light vehicles. In particular, please indicate if in your opinion there is a market for EETS for light vehicles, and under what conditions. Please be specific in your answers and support them with references to concrete examples, data and information.

This question was mainly of relevance to toll service providers, toll chargers and road transport associations. There were differing views as to whether there was a market for EETS for light duty vehicles and so whether the EETS Directive should cover tolling systems for such vehicles. The majority of respondents that expressed an opinion believed that there was not a case for expanding the EETS Directive to cover LDVs. Of those that disagreed, a minority called for different provisions for LDVs compared to HDVs, while the remainder argued for the same treatment of both types of vehicle.

Of those who argued that the short-term focus of EETS should be on HDVs, it was noted that LDV travel was predominantly on domestic roads, that LDVs were a completely different sector from HDVs and that any lack of interoperability of light duty tolling schemes had little impact on the functioning of the internal market. Others noted that cross border light duty traffic tended to be seasonal, e.g. holiday traffic, or limited to specific border areas. It was also noted that tolling systems that are currently in use for LDVs are generally less technically demanding and facilitated by online purchases compared to those used for HDVs. Where there was a higher level of cross-border LDV traffic, several respondents argued that bilateral agreements between the Member States concerned would be more appropriate to solve any interoperability problems.

A UK consultancy also suggested that the revenue collected from LDVs would be lower on average than for HDVs, so the business case for LDV services was more sensitive to the costs of the system. Some acknowledged that the majority of road traffic consisted of LDVs, but argued that cheap and simple solutions needed to be considered for these vehicles supported, not by EU legislation but by guidance. Another respondent representing Fédération Internationale de l'Automobile argued that electronic systems for LDVs are onerous to implement. Other respondents noted that while there was currently no apparent market for EETS for light duty vehicles, this situation may change in the future, particularly if systems developed that involved using OBUs in passenger cars.

Those who supported the inclusion of LDVs within the scope of the EETS legislation, but with a different approach compared to HDVs, recognised some of the above issues, but still believed that including light duty vehicles within the legislation was important. The different treatments proposed for LDVs included there being no requirements for a GNSS OBU for these vehicles, and instead allowing ANPR-based systems and RFID. The rules, processes and even timelines that would apply to light duty vehicles could also be different to those applying to HDVs.

Of those supporting the extension of EETS to LDVs under the same conditions as for HDVs, one respondent (Kapsch Traffic Com) argued that a market exists and would become more relevant once more cities introduced charging schemes, which should be covered by EETS. From the perspective of the EETS provider, integrating light duty vehicles into the system comes at little additional cost, so would improve the business case for providers. As a result of their support for the inclusion of LDVs in EETS, a Swedish public authority argued that it should be a requirement that an EETS provider can handle both DSRC and GNSS, although both functions should not be mandatory in all EETS OBUs. Other respondents argued that the technology requirements should be the same for both light and heavy duty vehicles, as otherwise interoperability would be put at risk and economies of scale would not be delivered.

Question 18: Please rank the solutions (including sub-solutions) listed above according to your preference (1=preferred solution) and explain your choices, including references to concrete examples, data and information

Respondents were asked to rank the potential solutions to the problem in order of preference. A total of 16 respondents participated in this process. Responses were from a variety of different stakeholders.

For the ranking analysis, a points system was developed, awarding various scores according to each respondents ranking. One or two points were awarded for preferring to either (a) exclude light vehicles from the scope, or (b) have specific rules but keeping light vehicles within EETS. One-four points were then given for the different ranking of rules for option (b). A zero was given to any solution not given a ranking. Results were gathered in terms of total scores for each solution and plotted as relative

percentages, as shown in Figure 2-15 and Figure 2-16 below. Due to the differing number of ranks given by each respondent (some ranked all parts of the solutions, others only ranked a couple of rules) average scores are not included in this report.

Figure 2-15: Survey response on the solution to solving the differences between light and heavy duty vehicles, ranked according to preference

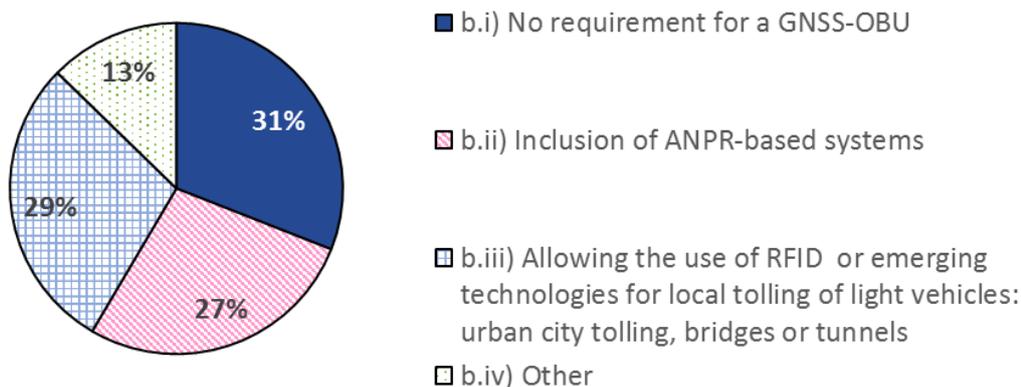


Figure 2-16: Survey response on whether light vehicles should be excluded from the scope of the legislation or not

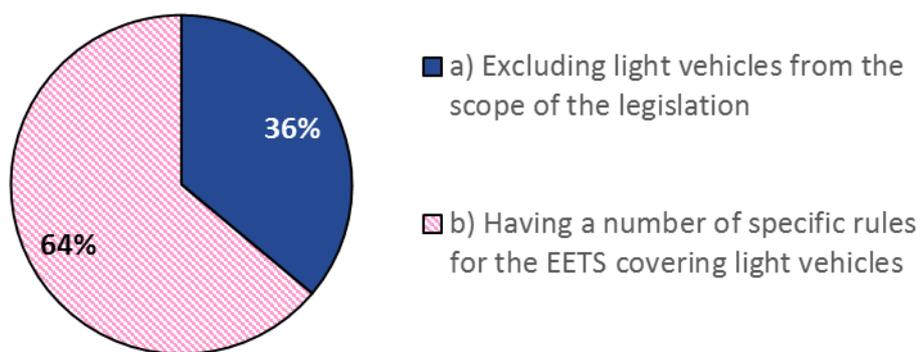


Figure 2-16 shows that, out of the 16 respondents, a strong majority (64%) felt that instead of removing light vehicles from the EETS scope altogether, having a number of specific rules for different vehicle types was the better option to solve the issues between different vehicles and requirements. Analysis of the different rules that could be implemented highlighted that there were mixed opinions about the preferred option, with all three suggestions gaining 27-31% support (as shown in Figure 2-15).

When analysed by stakeholder group it was found that 67% of toll service providers agreed with having specific rules as opposed to excluding light vehicles from EETS, whereas 75% of toll chargers felt it would be better to completely exclude light vehicles from the EETS scope altogether. No significant findings were apparent with regards to the different rules suggested.

Respondents were free to provide additional comments about the question and their explanation of choices, which have also been analysed. Most respondents provided opinions on the different rules and technologies as discussed below. However, two respondents representing public authority/toll chargers and road user/industry associations (UETR) had no preference, and suggested that implementation of passenger cars in EETS would have little impact on the proper functioning of the internal market, unlike for HDVs.

Three respondents representing mixed stakeholders (public authorities/administration, consultancy and toll charger) concluded that differentiating between vehicles only hinders EETS deployment as well as introducing further differentiation between technologies used to identify vehicles. A compulsory EU harmonised modular toll system based on distance travelled and applied to all vehicles would prove the best system to achieve the EETS needs and objectives.

One respondent representing the Norwegian public authority/administration NRPA suggested that a GNSS for light vehicles would put a burden on car owners due to the high price and complexity of the required OBU. Three respondents (two public authorities/administrations and one consultancy) discussed the possibilities of the inclusion of ANPR based systems for light vehicles. They underlined that utilising all types of system including ANPR could be successful in the exchange of data for toll enforcement purposes. However it should only be used if it does not imply additional hardware on board, and other obligations from the EETS directive and decision should not be applied to it as it would be disproportional. Additionally, there could be a limit to the success of ANPR due to the reduced success of optical recognition technologies during poor weather conditions, ultimately leading to reduced identification and income.

Analysis revealed mixed views on allowing RFID or emerging technologies applied to light vehicles. Two respondents representing road users and a consultancy (Fédération Internationale de l'Automobile and Lecit Consulting s.r.l.) felt that emerging technology should be allowed as long as it meets certain requirements: it does not imply additional hardware on-board; registration is easy; the system is transparent, user friendly and efficient; and it allows timely and simple payment through electronic means while also offering a non-electronic payment alternative. On the other hand, two respondents (an Austrian toll system operator and the Norwegian public authority/administration (NRPA)) discussed the unsuitability of using RFID and emerging technologies, as they will decrease the degree of harmonisation and interoperability while increasing the cost of on-board equipment, and believe RFID cannot fit the requirement of providing collectors with secure identification of information.

2.2.2.8 Other

Question 19: Please indicate any other comments or recommendations which you would like to make in the framework of this consultation.

A number of respondents concluded with additional comments or recommendations.

ASECAP summarised experience from the REETS project. First they underlined the need for a market platform as a mechanism for the formal exchange of information, as was set up in the REETS project and was (vaguely) foreseen in Decision 2009/750. Second they underlined that the extension of EETS to every EU citizen would be a long-term process possibly being phased in on a regional basis. As a result, the revised legislation should clearly distinguish between EETS and REETS services, including who is going to provide and consume the respective services.

Another respondent representing Fédération Internationale de l'Automobile underlined that the principles of data protection, non-discrimination and transparency were indispensable and need to be strictly respected. Data kept should be minimal and be kept only for a limited period, while the Commission should explore what legal guarantees might be given against the potential abuse of data. Transparency from those setting up charging schemes is important both in terms of the objective of the scheme and the use of the revenue, a share of which should be earmarked to address the objective of the scheme, e.g. increased funds for road maintenance. An industry association respondent identified similar principles as well as some additional ones, including that double charging is avoided, that charging is undertaken as cost-efficiently and as seamlessly as possible, that the administrative burden for road users is minimised, that a level playing field with other modes is ensured and that the framework fosters interoperability and supports the deployment of the latest technologies and ICT solutions.

Another respondent from EUCARIS noted that the EUCARIS solution could be adapted and implemented for the cross-border enforcement of EETS with minimal technical effort. Via Verde Portugal suggested that a roaming fee might be charged to foreign-registered vehicles, as charging these involved additional costs.

A Czech toll service provider highlighted that their main concern was that free vertical integration should not be allowed, as if it risks reducing competition and consumer protection. Abertis argued for the need for a holistic approach based on a compulsory EU harmonised modular toll system that is applied to all vehicles.

A number of respondents made specific recommendations, including:

- Registration procedures be harmonised in order to ensure fair and non-discriminatory treatment of service providers.
- Accredited toll chargers to have access to information in a European national licence plate database for the purpose of enforcement.
- An obligation be put on service providers to efficiently cooperate with toll chargers to provide the requested information in the case of toll evasion.
- The possibility of starting EETS certification in any country, regardless of the country of origin of the service provider.
- Allowing manufacturers to certify products and thus be able to offer certified produced to EETS providers, which do not need to be certified again.

A UK Consultancy outlined further work that needed to be undertaken. This included defining a standards framework for EETS, further economic appraisal to estimate the size of the market, review of other regulatory models for service provision, the introduction of different classes/levels of service and the technical appraisal and testing of other technologies.

2.3 Task 2.3: Public Consultation 2016

The public stakeholder consultation for this project was launched on 8th July 2016 and was open for responses until 2nd October (12 weeks). Respondents were also given the opportunity to provide any further comments at the end of the questionnaire. This analysis of the public stakeholder consultation is intended to provide an overall view of the responses to the questionnaire, as well as a summary of the additional comments provided. Note that any lengthy additional responses, position papers or attachments were processed as part of the analysis for Task 2.4 on spontaneous contributions.

Please note that the views presented can only be associated with respondents to this specific consultation and may not be representative of the views of all or specific groups of stakeholders.

2.3.1 Analysis of respondents' profile

A total of **73 responses** to the questionnaire were received. The responses covered a variety of stakeholder groups, as shown in Table 2-5.

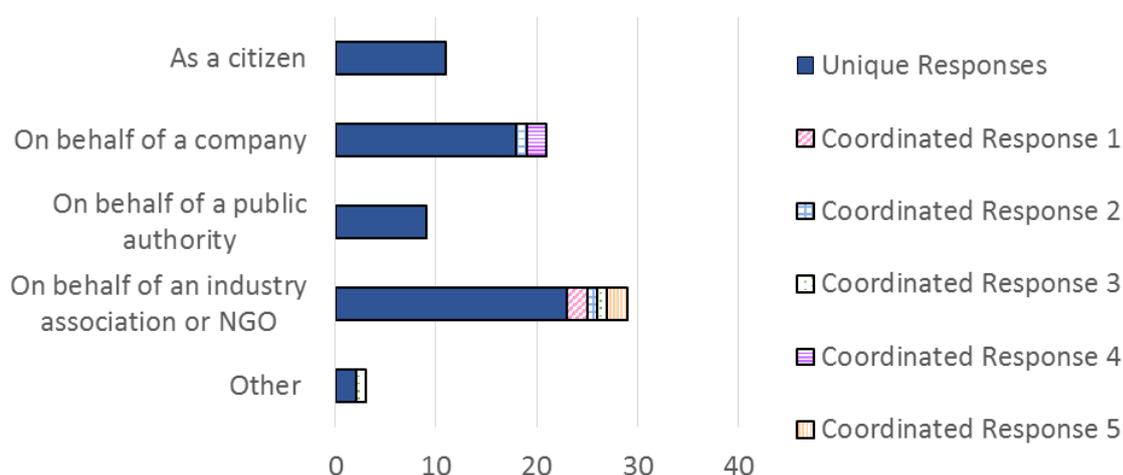
Table 2-5: Classification of stakeholders responding to the questionnaire

Stakeholder category	Number of responses	% of responses
On behalf of an industry association or a non-governmental organisation (NGO)	29	40%
On behalf of a company	21	29%
As a citizen	11	15%
On behalf of a public authority	9	12%
Other	3	4%
Grand Total	73	100%

Notes: Other is based on the respondents' choice and includes: company and citizen, European employer's association, and Ministry of Enterprise and Innovation

A number of coordinated responses were received, indicating that these respondents followed a template for answers. Five different templates were identified from the analysis of the sample, as shown in Figure 2-17. However, since all respondents were free to adapt the answers to correspond with their own views, all responses have been analysed individually in the following sections.

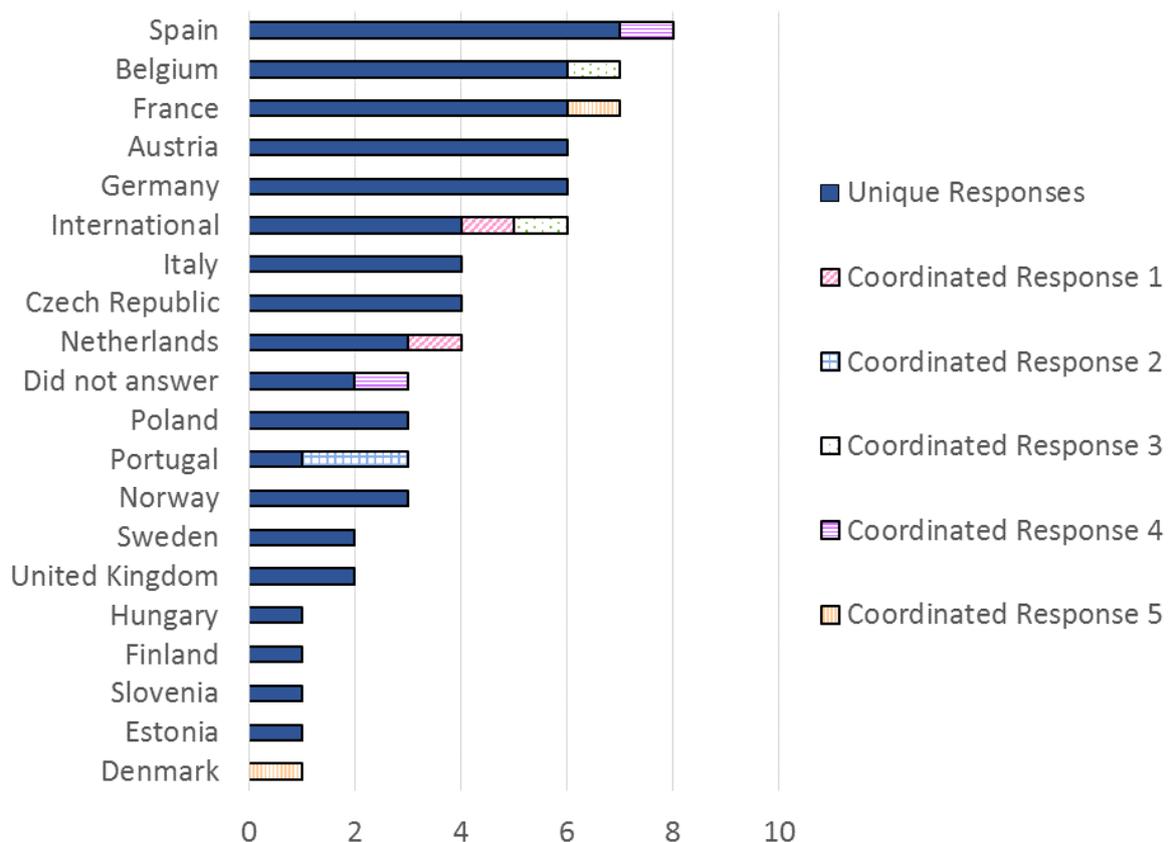
Figure 2-17: Distribution of the responses by stakeholder group - showing coordinated responses



The total number of coordinated responses identified was 10, representing 14% of total responses.

Responses were received from respondents residing in, or organisations based in 17 EU Member States (Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Italy, Netherlands, Poland, Portugal, Slovenia, Spain, Sweden and the United Kingdom), whilst three responses were also received from Norway. The distribution of responses by country of residence or establishment is shown in Figure 2-18. The largest number of responses were from Spain, Belgium and France, which contributed 24 responses between them (33% of the total).

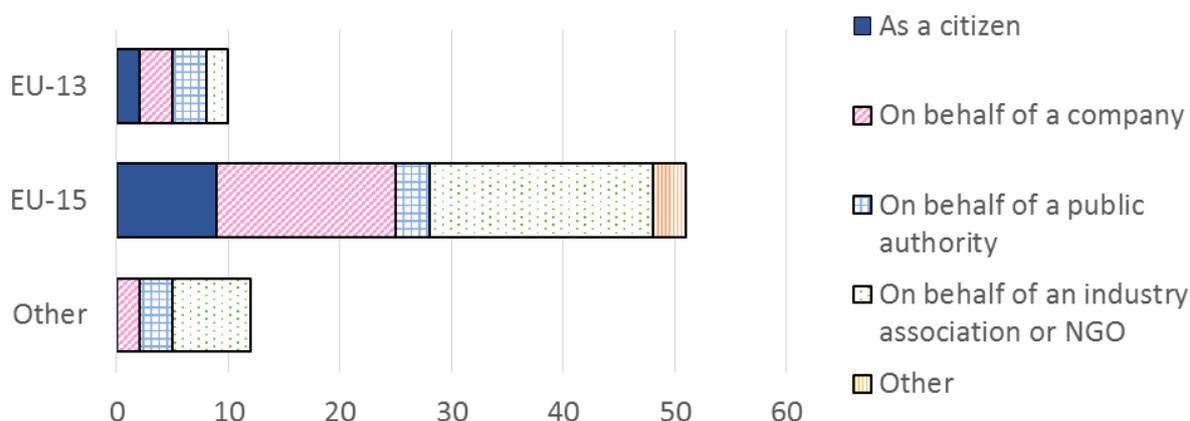
Figure 2-18: Distribution of the responses by country of residence/establishment



Notes: International includes International and/or European organisations

When survey response is split by EU-15 and EU-13 membership, as in Figure 2-19 it is apparent that the majority of responses are from EU-15 Member States, with 70% of responses being from these States. Therefore, conclusions drawn from this analysis may be biased towards the views of respondents from these Member States.

Figure 2-19: Distribution of responses (split by respondent category) by EU-15 and EU-13 membership



The interest groups which respondents represented were also collected as part of the survey. These interests have been further categorised during the analysis of the results (after the survey) and are shown in Table 2-6 below.

The reason for using these alternative interest categories was due to the large variation in response rates for each of the original interest categories, as well as the fact that certain interest groups can be associated with more than one stakeholder group (e.g. toll chargers can be public authorities or companies). By reorganising the groups in this way, a more even balance can be obtained and conclusions drawn from the analysis can be attributed to specific interest groups, thereby making them more meaningful. Therefore, throughout the subsequent analysis results are only presented by the interest groups listed below and, additionally, only include results representing above 5% of respondents to avoid skewed and insignificant conclusions.

Table 2-6: Classification of respondent interests

Stakeholder category	Number of responses	% of responses	Reported?
Road charging infrastructure operators and solution providers/their representatives (shortened to 'infrastructure operators and solution providers' from now on)	23	32%	Yes
Road freight transport	15	21%	Yes
Private car/motorbike use	11	15%	Yes
Many/other transport mode(s)	9	12%	Yes
Other	6	8%	Yes
Public Authority	6	8%	Yes
Professional road passenger transport	2	3%	No
Rail transport	1	1%	No
Grand Total	73	100%	

Notes: Other is based on: private citizen, consultant, transport users, retail of the petroleum industry, a broad spectrum of enterprises in the Swedish transport sector, and did not answer

2.3.2 Results

Results from the survey are presented and discussed below. Each sub-section below represents one question from the original survey.

2.3.2.1 Question 1: Do you think that the EU legislation should provide for the separation of accounts between the toll-charger and toll-service-provider activities, when they are both performed by the same company?

A large proportion of respondents (63%) felt that EU legislation should provide for the separation of accounts between toll charger and toll service provider activities (as seen Figure 2-20 below). Conversely, 15% of respondents felt that EU legislation shouldn't provide for separation of accounts, while an additional 21% did not know either way.

No significant variation of opinions was identified between respondents from the EU-13 compared to the EU-15. At least 50% of each agreed that EU legislation should provide for the separation between toll chargers and toll service providers, while approximately 20% disagreed, and c. 30% did not know. When disaggregated by representing interest as shown in Figure 2-21, again no major variations were apparent between interest group, except with the 'other' (6 respondents) category where more mixed views were observed. However because we do not know what interest group these respondents represent, we cannot draw any meaningful conclusions from this variation.

Figure 2-20: Survey responses on whether the EU legislation should provide for the separation of accounts between toll charger and provider

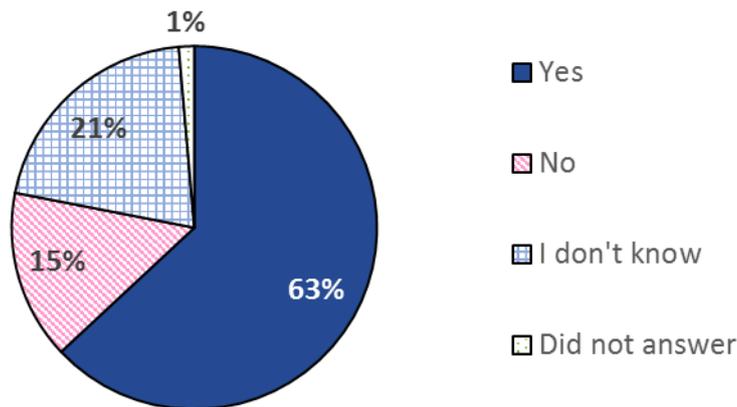
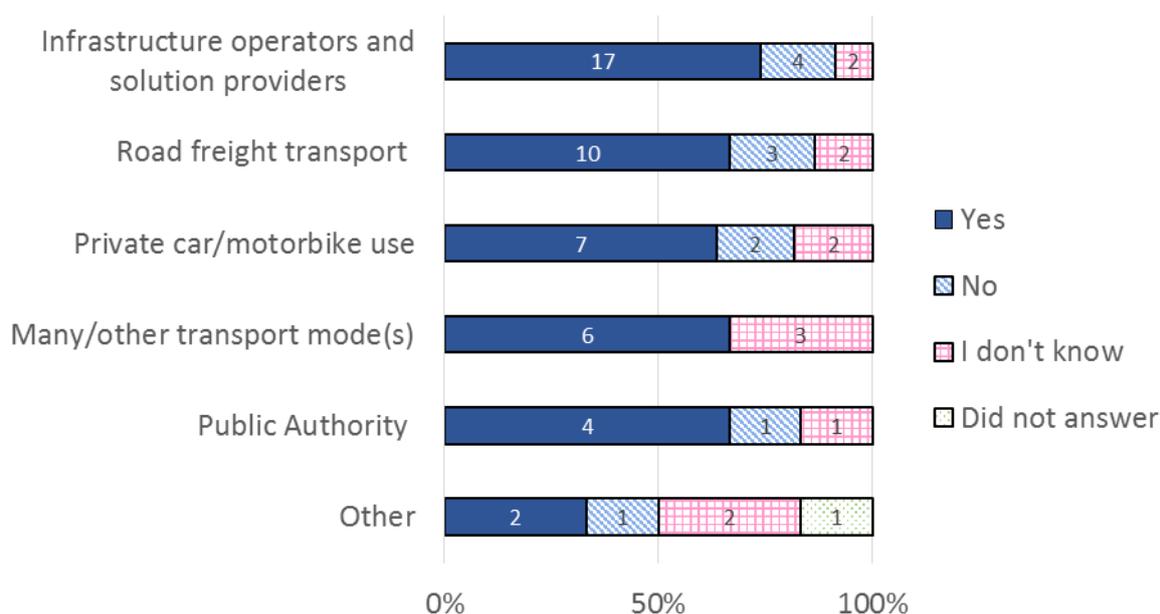


Figure 2-21: Survey responses on whether the EU legislation should provide for the separation of accounts between toll charger and provider, disaggregated by representing interest

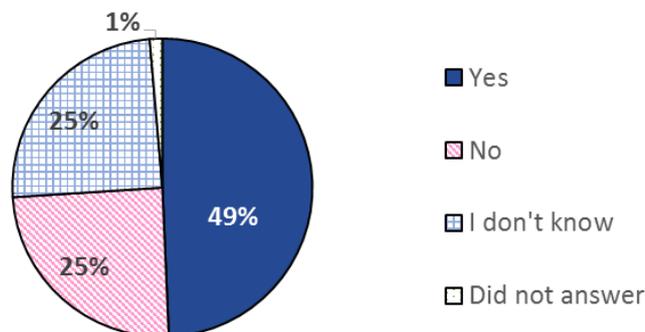


Respondents were also free to provide additional comments about the question if they wished, and these have also been analysed. A total of 7 respondents, the majority representing interests in toll charging infrastructure operators and solution providers, emphasised that the separation of accounts provided by the EU legislation would ensure fair division and treatment between chargers and service providers and create clearly defined roles and responsibilities. It was also noted by 5 respondents, (representing interests in charging infrastructure operators/solution providers and road freight transport) that separation would also support transparency between the different entities. Another 4 respondents, who belonged to road freight transport, public authority and infrastructure operators/solution provider interest groups, additionally felt that it would prevent conflicts/disruption including providing a guarantee in the event of bankruptcy of one of the entities, or prevent the violation of rules of free market competition between companies. However, 3 respondents representing interests in private use, freight transport and charging infrastructure operators/solution providers, believed that competition would not benefit from this separation, and could be a waste of time and result in additional costs.

2.3.2.2 Question 2: Should the powers of the conciliation bodies be increased so that they can enforce the respect of the outcome of the mediation procedure upon the parties to the dispute?

As presented in Figure 2-22 approximately 50% of the survey respondents felt that powers of conciliation bodies should be increased so that they can enforce mediation outcomes, whilst 25% felt that powers should not be increased, and another 25% did not know.

Figure 2-22: Survey responses on whether respondents agree to the potential increase in enforcement powers of conciliation bodies

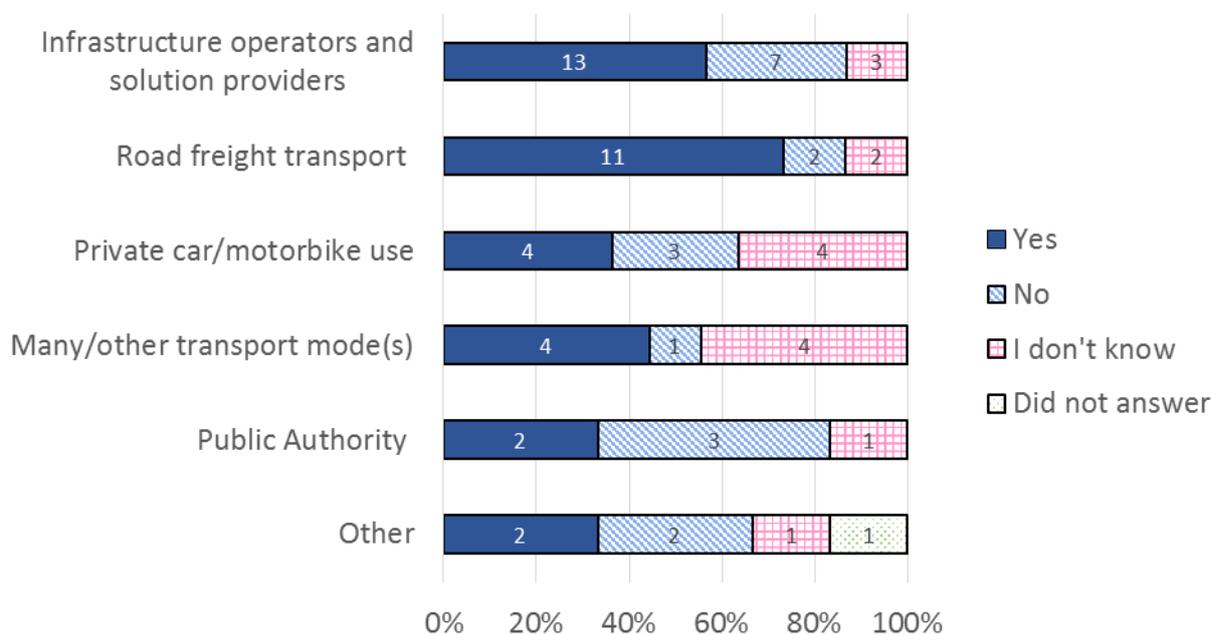


When disaggregated by EU-13/EU-15 membership, respondents showed similar consensus, with between 47-58% of respondents agreeing with increased powers for conciliation bodies.

A wider range of views is apparent when considering the interests that the respondents represent as shown below in Figure 2-23. For example, 73% of respondents representing road freight transport agreed that powers of conciliation bodies should be increased to enable enforcement of mediated outcomes, in comparison to 55% of infrastructure operators/solution providers and 30-35% of public authorities and private users. The strongly positive response from road freight transport representatives illustrates their desire for a fair and efficient market, whilst the more negative response from infrastructure operators and public authorities could be an indication that they see additional complexity and risks associated with enforced mediated outcomes between themselves and toll service providers in certain markets.

Six stakeholders (the majority representing interests in toll charging infrastructure operators/solution providers, and one representing a public authority) noted in their additional commentary that the powers of conciliation bodies should be increased as it would facilitate further development of harmonised toll collection systems through helping to remove discriminatory hurdles, and manage/solve possible conflicts between the toll chargers and service providers. However, another two respondents (representing private road user or infrastructure operator/solution provider interests) felt that additional powers for conciliation bodies were not necessary and that normal courts or independent road authorities are perfectly capable of giving a formal enforceable decision.

Figure 2-23: Survey responses on whether respondents agree to the potential increase in enforcement powers of conciliation bodies, disaggregated by representing interest



2.3.2.3 Question 3: Should the European Union: Leave it to the EETS providers to decide which toll domains they want to cover by their services; maintain the obligation for EETS providers to cover all toll domains in the EU; or other (please specify)?

As highlighted in Figure 2-24 51% of respondents felt that the European Union should leave the EETS providers to decide which toll domains they want to cover by their services, 24% believed the EU should maintain the obligation for EETS providers to cover all toll domains in the EU, and the other 25% felt that another outcome should occur. The most common ‘other’ suggestion (provided by five respondents) was that EETS providers should begin by deciding which toll domains they want to cover, but then eventually cover all EU tolled roads in the long run; excessive requirements imposed on the provider (i.e. 24-month full coverage, requested bank guarantees etc) should be relaxed but they should nevertheless be obliged to cover all domains needed by their customers within a certain period of time.

Minimal variation was observed between EU-13 and EU-15 respondents, with slightly fewer EU-15 respondents (45%) believing EETS providers should have the freedom to decide which domains they cover and slightly more of them supporting the EU obligation being maintained (29%).

A broader set of views was observed when representing interests are taken into account, as shown in Figure 2-25. Unsurprisingly, given the significant complexity, costs and risk of covering all EU domains within 24 months of launch, a very large proportion (c.80%) of respondents representing toll chargers or service providers were in favour of allowing EETS providers to decide which domains they should cover. However, only c. 30-35% of respondents from the other interest groups agreed that the regulation should be relaxed; between 50-67% of public authority and ‘other’ representing respondents suggested an ‘other solution’ as described above, while between c. 45-55% of respondents representing private use and many/other transport modes suggest that the current obligation should be maintained. This illustrates the strongly differing priorities of those toll infrastructure operators/service providers compared to the other interest groups (in most cases representing road users).

Figure 2-24: Survey responses on whether or not the EU obligation for EETS providers to cover all toll domains should exist.

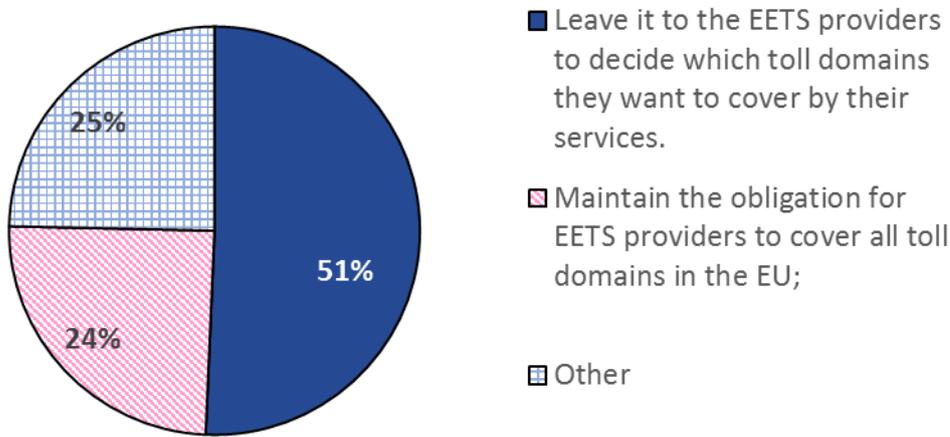
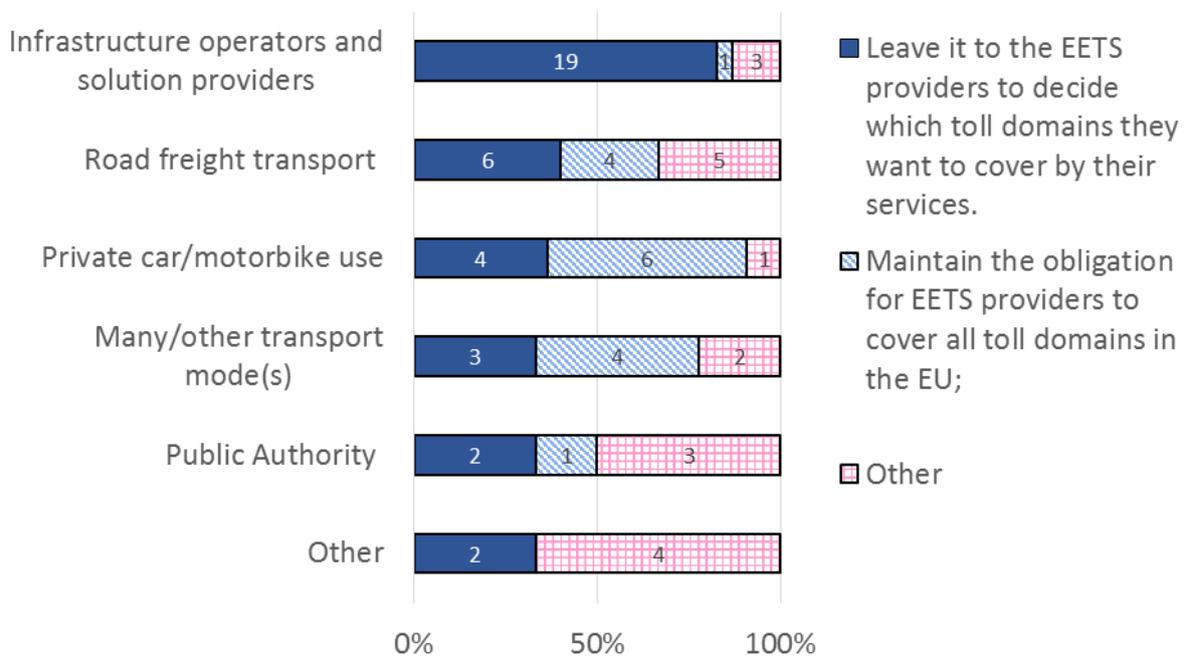


Figure 2-25: Survey responses on whether or not the EU obligation for EETS providers to cover all toll domains should exist, disaggregated by representing interest



Analysis of the respondents' extra voluntary comments highlighted the strong desire amongst some (11) respondents (including 6 representing interests in toll charging infrastructure operators/solution providers and 2 representing public authorities) for the removal of the obligation for EU wide coverage within 24 months, because of its unfeasibility, unrealistic nature and the fact it limits competitiveness. 7 respondents (the majority representing interests again in toll charging infrastructure operators/solution

providers) believed that EETS development should be market driven and representing customer's demand - market dynamics should define which toll domains EETS providers should cover, ensuring the optimum outcome for road users. Additionally, another 4 respondents from varying interest groups (toll charging operators/solution providers, private users and freight transport) proposed that a minimum coverage requirement should exist to retain the value of EETS, focusing first on specific geographic areas and perhaps covering a minimum of 2 or 3 national systems.

2.3.2.4 Question 4: Do you think the scope of EETS should be extended to systems based on automatic number plate recognition, such as e-vignettes or the London congestion charge?

Analysis revealed that 60% of respondents felt that the EETS scope should be extended to ANPR based systems, whereas only 29% felt it should not and 11% were undecided, as presented in Figure 2-26. There was little variation between responses from EU-13 vs. EU-15 respondents.

When disaggregated into representing interest, again, differences were most apparent between road users (road freight transport operators, users, etc.) and toll chargers/service providers, with c. 60-80% of respondents agreeing that the scope of EETS should be extended to include ANPR technologies, compared to just 16-48% respectively (Figure 2-27). This is consistent with road users wanting maximum flexibility in accessing toll services, whilst toll chargers and service providers are perhaps more aware of the complexities and costs involved in adopting additional technologies.

Figure 2-26: Survey responses on whether respondents agree with the extension of the EETS scope to ANPR based systems

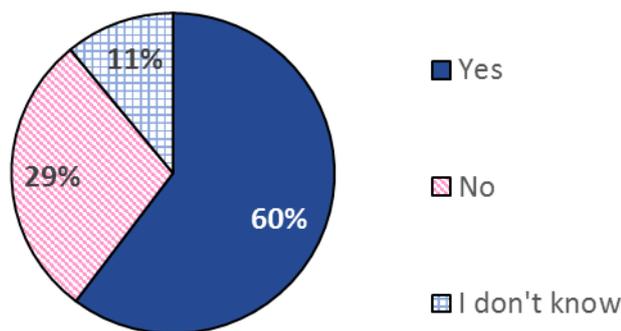
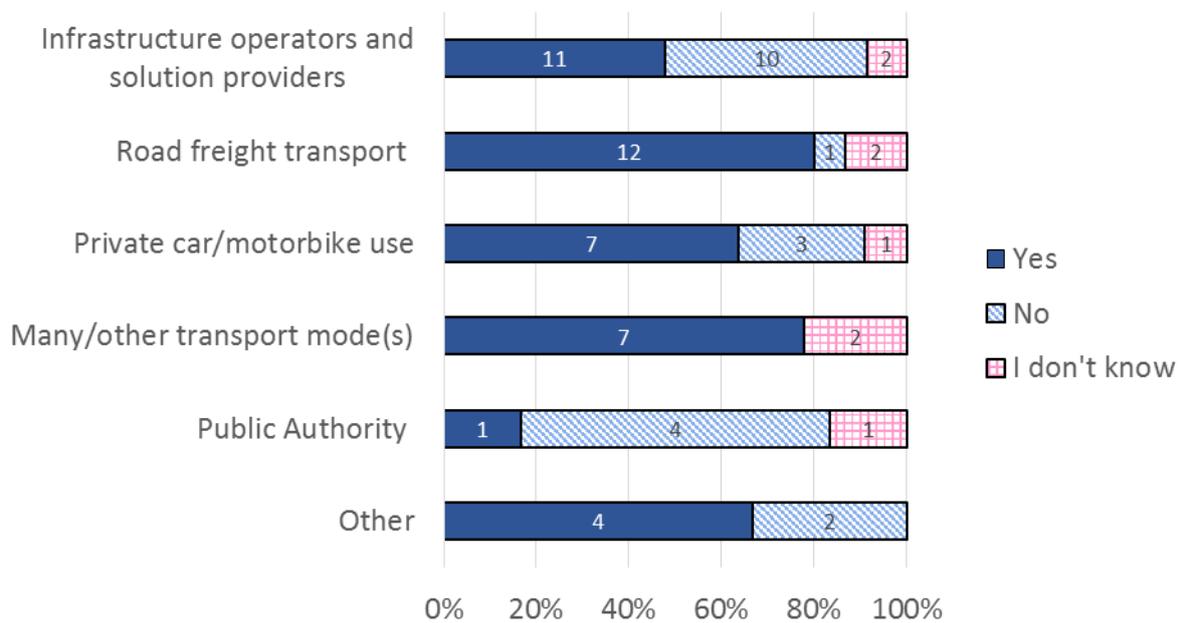


Figure 2-27: Survey responses on whether respondents agree with the extension of the EETS scope to ANPR based systems, disaggregated by representing interest



Analysis of the additional text provided by respondents highlighted the agreement amongst many (8 respondents covering all interest groups except “many/other transport modes”) that ANPR technology is unsuitable/not good enough for the EETS EU framework. Reasons given for this view included:

- It is unsuitable for light vehicles;
- It is restricted to local infrastructure and not suitable for distance based charging;
- It is unable to achieve the efficiency of a radio frequency system;
- The time based system is unfair and does not comply with the polluter pays principle;
- It does not provide secure identification information;
- It is limited in importance as a means to facilitate cross-border transport.

Other respondents however noted the potential benefits of ANPR. Four respondents representing interests in freight transport, toll charging infrastructure/solution providers and ‘other’ mentioned the fact it facilitates seamless uninterrupted journeys for road users across different roads using different tolling technologies. An additional 4 respondents representing interests in toll charging infrastructure operators/solution providers and ‘other’ also stated it could facilitate discussions and lead to the development of interoperability in other systems not currently covered by the EETS Directive e.g. parking costs.

2.3.2.5 Question 5: Do you think that the EU should continue regulating how to achieve interoperability between electronic tolls applying to passenger cars, or should this be left for the Member States to achieve?

As shown in Figure 2-28 62% of respondents felt that EU rules were needed with regards to how to achieve interoperability between electronic tolls applied to passenger cars. 22% felt that this matter should be left to individual Member States to achieve, whilst the final 16% felt an alternative action was required or they were not in a position to say. Respondents answering ‘other’ highlighted issues such as the removal of tolling for passenger cars (2) and leaving the issue to the market.

Figure 2-28: Survey responses on regulating interoperability between electronic tolls

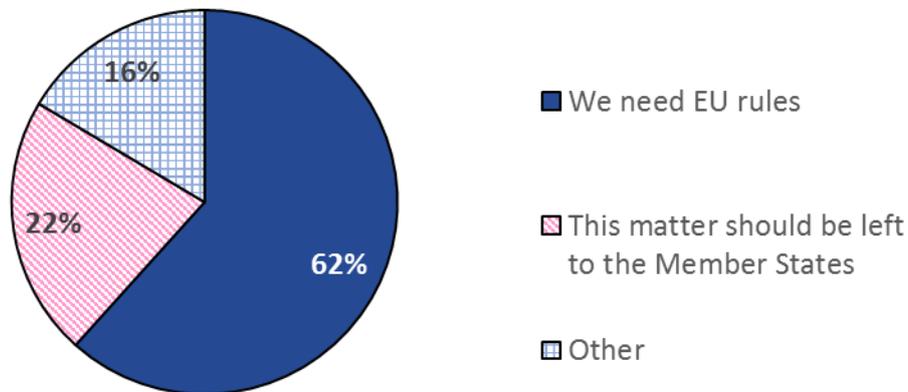
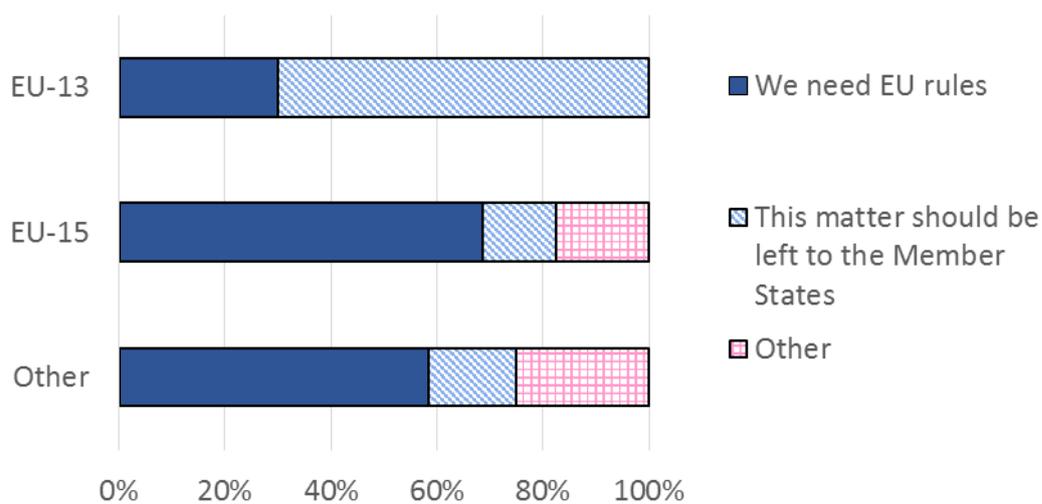
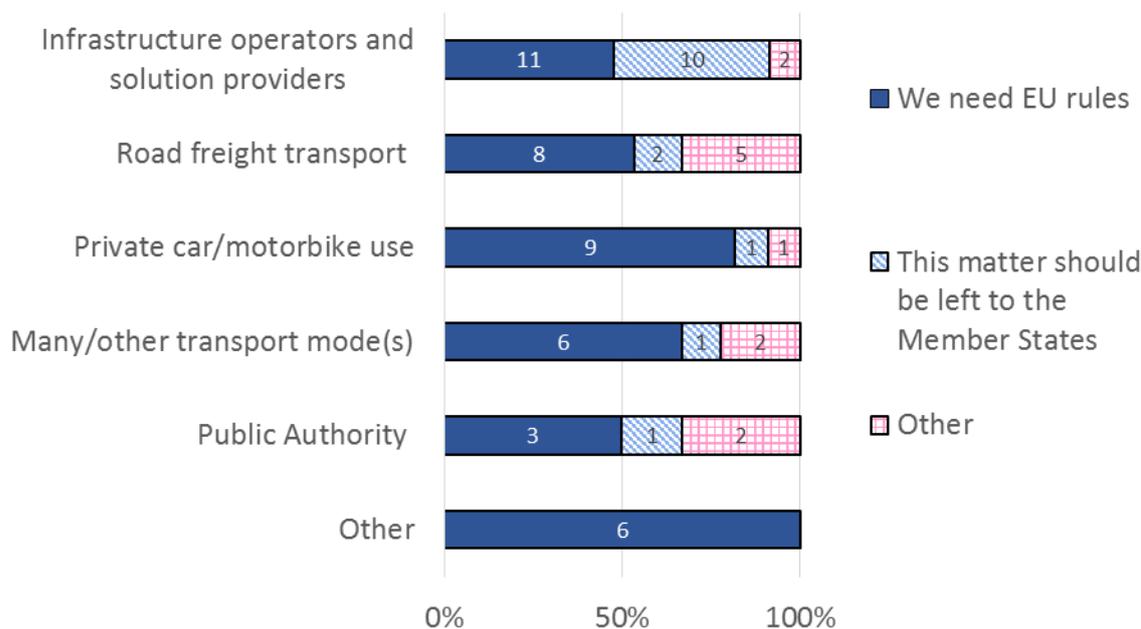


Figure 2-29: Survey responses on regulating interoperability between electronic tolls, disaggregated by EU-13/EU-15 membership



Disaggregation with respect to EU-13/EU-15 membership in Figure 2-29 highlighted that over double the percentage of respondents from EU-15 States were in agreement with EU rules compared to the percentage of EU-13 States (68% compared to 30% respectively). This may be an illustration of the different levels of acceptance of electronic tolling technologies amongst the older and new Member States (and also of the more extensive and mature use of electronic tolling in EU-15 Member States).

Figure 2-30: Survey responses on regulating interoperability between electronic tolls, disaggregated by representing interest



The question received a relatively mixed response when categorised into representing interests as shown in Figure 2-30 above. Responses representing ‘other’ interests showed the strongest agreement with the need for EU regulation (100%), whilst other significant interest groups (several of which represent road users, e.g. the road freight transport and private road user categories) were approximately 50-80% in favour, illustrating the desire of road users in particular to have strong rules in place to enforce European interoperability of electronic tolling for cars. Toll chargers/service providers were most strongly in favour of leaving the matter to Member States (43%), perhaps indicating their understanding of the costs of complexities of further investment in interoperability covering passenger cars.

2.3.2.6 Question 6: Should the European Union establish a mandatory mechanism for the exchange of data on toll offenders to facilitate recovery of unpaid tolls, or should Member States be left to decide if they wish to participate in such exchanges on a bilateral basis?

Strong consensus was observed regarding responses to this question, Figure 2-31 showing that 77% of respondents agreed that the EU should establish a mandatory mechanism for the exchange of data on toll offenders to facilitate recovery of unpaid tolls. Only 12% felt that Member States should be left to decide if they wish to participate in such exchanges on a bilateral basis. The remaining 11% of respondents either had no particular opinion, felt the issue was not relevant to them, or considered the need for a mandatory mechanism only if Member States could retain the right to apply special measures against toll offenders who remain in the State the offence was committed in.

Strong consensus was found between EU-13/EU-15 groups. When categorised into representing interest in Figure 2-32, strong consensus was also observed, with only road freight transport respondents exhibiting any significant desire to remain with the status quo (27%) – perhaps illustrating fears amongst hauliers of being exposed to receiving fines from multiple Member States.

Figure 2-31: Survey responses on whether an EU mandatory mechanism for data exchange on toll offenders should exist.

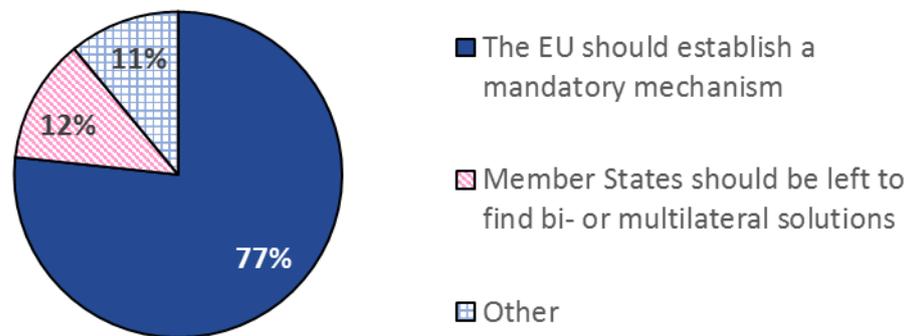
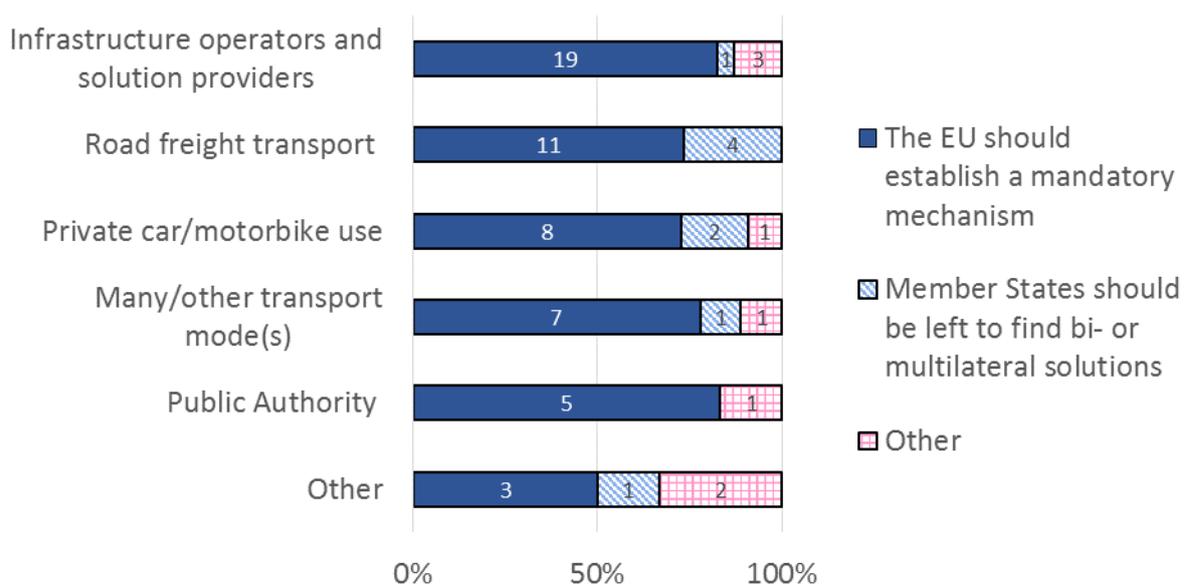


Figure 2-32: Survey responses on whether an EU mandatory mechanism for data exchange on toll offenders should exist, disaggregated by representing interest



As part of the free text responses, 8 respondents (representing interests in freight transport, toll charging infrastructure operators/solution providers, and many/other transport modes) highlighted the importance of fair treatment and equality with respect to enforcement of fines. They agreed that toll evasion provides unfair competition for domestic/local users and that establishing a mandatory mechanism is needed to remove discrimination for road users from different jurisdictions. 5 respondents (from public authority, freight transport, and toll charging infrastructure operator/solution provider interest groups) suggested that the EU could use a mandatory mechanism similar to EUCARIS which is used for traffic offences.

2.3.2.7 Question 7.1: Should the European Commission be given the right to scrutinise the planned architecture of new electronic tolling systems (including tender specifications for the contract to set up and operate the tolling scheme) and take a position, before they are put in practice?

As shown in Figure 2-33 below a moderately strong agreement exists in favour of the European Commission's rights to scrutinise planned electronic tolling systems. 62% of total respondents agreed that the Commission should be given rights, whereas 29% believed they should not. An additional 8% did not know either way. Views were mixed when segregated by EU Membership. EU-15 countries were more in favour (65%) of these rights, compared to EU-13 countries (50%).

The opinion between different groups of representing interests was mixed, as shown in Figure 2-34. Respondents representing road users (i.e. transport, private car/motorbike use and many/other transport mode(s)) were in strong favour of the Commission being able to be involved in new electronic tolling systems (between 73-80%), whereas respondents representing toll infrastructure operators/service providers (i.e. public authorities and infrastructure operators and solution providers) were strongly against this being adopted (between 40-83%). This variation is likely due to that fact that road user groups are keen for interoperability to be ensured by all means necessary, whereas operators/service providers are more aware of the costs, risks and potential complexities that could arise from such an arrangement, plus the additional competitive pressures that could result from this change.

Figure 2-33: Survey responses on whether the European Commission should have the power to scrutinise planned architecture of new tolling systems

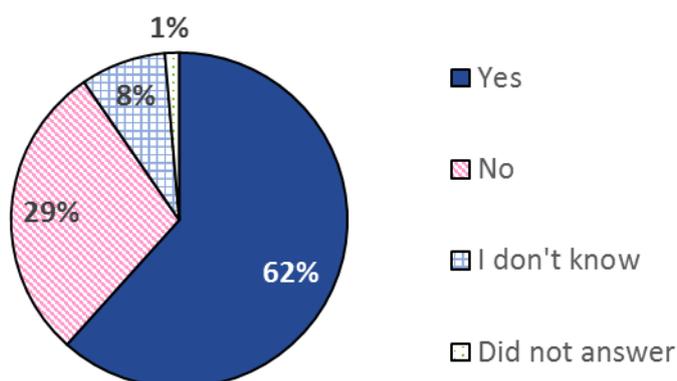
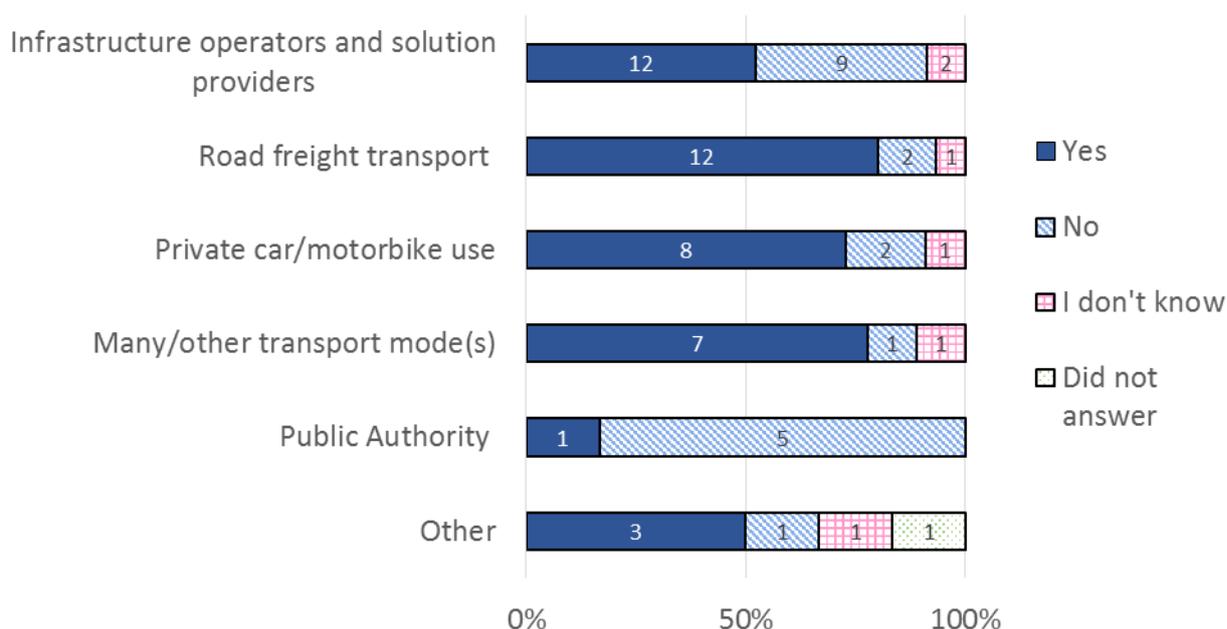


Figure 2-34: Survey responses on whether the European Commission should have the power to scrutinise planned architecture of new tolling systems, disaggregated by representing interest



As part of the additional free text comments, 3 respondents from a mixture of interest groups (private road use, many transport modes and toll charging infrastructure operators/solution providers) felt that the European Commission should provide basic high level specifications which should be defined and respected at the start, then everything else should be left to the Member State/operator/technology provider. An additional 3 respondents, representing interests in toll charging infrastructure operators/solution providers and many/other transport modes, felt that listening and taking into account early guidance on standards and cost effective technology would limit/eliminate risks/problems further down the road.

2.3.2.8 Question 7.2: If Yes, should this position of the European Commission be binding to the Member State/road operator?

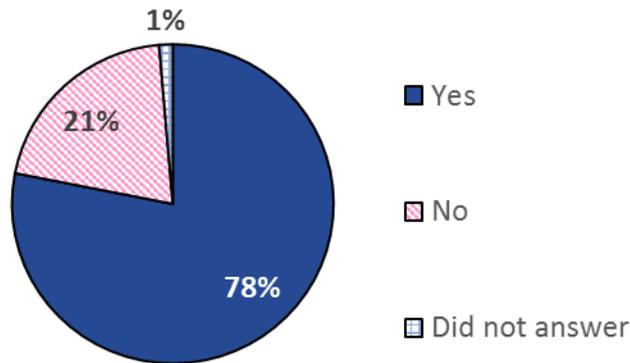
Of those respondents in favour of the Commission being able to scrutinise planned tolling architecture, in Question 7.1: Should the European Commission be given the right to scrutinise the planned architecture of new electronic tolling systems (including tender specifications for the contract to set up and operate the tolling scheme) and take a position, before they are put in practice? above. 89% felt that this position should be binding to the Member State/road operator, whereas only 11% didn't. When disaggregated by EU-13/EU-15 membership, it was shown that only respondents from EU-15 Member States were against the binding position, however this view was in a minority (15%) compared to those in favour (85%). Additionally, disaggregating against representing interest revealed that public authority respondents were the only category with a significant portion against a binding decision (50% against) whereas all other categories had the majority in favour.

A total of 6 out of 13 respondents that provided additional comments (the majority representing interests in toll charging infrastructure operators/solution providers) believed that only when it is binding will any evaluation/scrutiny be effective and provide a real benefit to the EETS market and providers, whilst ensuring that the interests of road users can be defended against those of individual Member States.

2.3.2.9 Question 8: Should the European Commission harmonise the procedures for accrediting an EETS provider to a toll domain, with the aim to reduce the cost and burden associated to it?

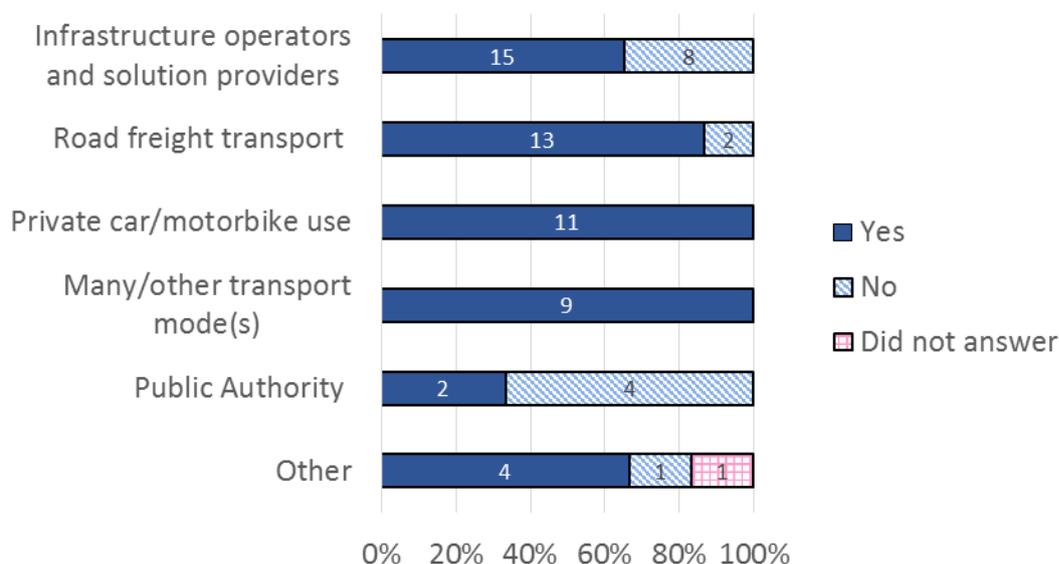
Analysis of responses from this question revealed that over three quarters of stakeholders thought the Commission should harmonise accrediting procedures between EETS providers and toll domains, whereas 21% did not (as seen in Figure 2-35 below).

Figure 2-35: Survey responses on whether the European Commission should harmonise accreditation of EETS providers to toll domains or not



Strong agreement between EU-13/EU-15 Member States was observed, with at least 75% of respondents in EU-13, EU-15 or other Member States supporting the harmonisation by the Commission. When disaggregated by representing interest, opinions were more mixed, as seen in Figure 2-36. Almost all road user respondents (i.e. between 87-100%) agreed with harmonisation of accreditation activities, whereas toll infrastructure operators / stakeholders had more mixed views, in particular public authorities, with 67% of respondents not in favour of harmonisation. This is in line with the split between road users and infrastructure operators/service providers as highlighted in sections 2.3.2.4, 2.3.2.5 and 2.3.2.7.

Figure 2-36: Survey responses on whether the European Commission should harmonise accreditation of EETS providers to toll domains or not, disaggregated by representing interest



From the free text responses, it was noted that 2 respondents (representing interests in freight transport and toll charging infrastructure operators/solution providers) felt that the European Commission must guarantee that Member States will comply with the rules to accept new EETS providers in their domains in a fair way, and entry barriers for providers to new toll domains should be removed or at least minimised as much as possible. In addition, another 2 respondents representing interests in toll charging infrastructure operators/solution providers felt that harmonisation would reduce costs which would then decrease barriers to entry and lead to the encouragement of competition in the toll market.

2.3.3 Conclusions

The responses to the Commission's public consultation have been reviewed. A total of 73 responses were received from a range of stakeholder types. It was noted that a few responses were either identical to another or nearly so, indicating that they were coordinated using consistent templates. Five such templates were identified in the responses.

Key findings are summarised in Section 2.3.3.1 below. In some questions consensus was strong, whilst for others opinions were more mixed. Responses were also analysed by EU-13/EU-15 membership and representing interest, in order to identify if any opinions gathered were biased by any of these categories.

2.3.3.1 Overview of findings

The overall findings to each key question are as follows:

- 1) 63% of respondents were in favour of EU legislation providing for the separation of accounts between toll charger and service provider activities.
- 2) Opinions were more divided regarding the suggestion that conciliation bodies should gain increased power for enforcement of mediation outcomes, with half of respondents in favour of increased power for conciliation bodies. However, double the number of respondents were in favour compared to those who were not.
- 3) Views were again mixed with regards to the current EU obligation for EETS providers to cover all toll domains within 24 months, with half of respondents in favour of a relaxation of the rules. Once again however, the number of respondents in favour of relaxing the rules was double the number of respondents wanting the current EU obligation to be maintained.
- 4) 60% of respondents were in agreement that the EETS scope should be extended to ANPR systems.

- 5) The majority of respondents (62%) agreed that the EU should continue regulating interoperability between electronic tolls applied to passenger cars. Three times the amount were in favour of this compared to those who believed this matter should be left to Member States.
- 6) A large majority (77%) of respondents were in favour of the EU establishing a mandatory mechanism for the exchange of data on toll offenders to facilitate recovery of unpaid tolls.
- 7) Views regarding the Commission's rights to scrutinise planned architecture of new electronic tolling systems were more mixed but with a clear majority agreeing (62%, double the percentage of respondents who disagreed) that the Commission should have the right to scrutinise planned new EETS systems prior to deployment. Out of those who agreed, an overwhelming consensus (89%) were in favour of the Commission's position being binding.
- 8) A large majority (78%) of respondents were in agreement that the European Commission should harmonise the procedures for accrediting an EETS provider to a toll domain, aiming to reduce the cost and burden associated to it.

2.3.3.2 EU-13/EU-15 Membership

There were generally limited differences between the views of respondents in different EU Member States on each of the questions asked in the public consultation. The only findings worth reporting were:

- EU-15 countries were less in favour compared to EU-13 countries of conciliation bodies gaining increased powers so that they can enforce mediation outcomes upon parties in a dispute.
- EU-15 countries were more in favour compared to EU-13 countries of the EU continuing to regulate how to achieve interoperability between electronic tolls applying to passenger cars rather than for Member States being left to achieve it.
- EU-15 countries were more in favour compared to EU-13 countries of the EU maintaining the obligation for EETS providers to cover all toll domains in the EU, instead of leaving it to the EETS providers to decide which toll domains they want to cover by their services.
- EU-13 countries were less supportive compared to EU-15 countries in giving the Commission regulatory and scrutinising powers regarding planned architecture of new electronic tolling systems (including tender specifications for the contract to set up and operate the tolling scheme).

2.3.3.3 Representing Interests

Significant variation was found between responses from different representing interest categories. The key trend highlighted was an apparent distinction between road user interest groups (i.e. freight transport, private use, many/other transport modes) and toll infrastructure operators/ service provider groups (i.e. infrastructure operators/solution providers and public authorities) on several issues, likely due to their differing self-interests. Road users want maximum flexibility in accessing toll services at the lowest cost possible and are therefore most keen for actions that encourage interoperability to be implemented. On the other hand, operators and service providers are more aware of the costs, risks and potential complexities involved in adopting and investing in additional technologies/methods, or of additional regulation, as well as the competitive pressures that could arise as a result. Examples of this difference in views include:

- Toll chargers/service providers were most strongly in favour (43%) of leaving Member States to achieve interoperability between electronic tolls for passenger cars, rather than having the EU regulating this, whereas road users were most in favour (50-80%) for an EU mandatory mechanism for passenger car interoperability.
- Toll infrastructure operators and solution providers were more in favour of EETS providers deciding which toll domains to cover (80%) compared to a compulsory EU obligation to cover all domains, relative to road users (with a maximum of 40%).
- 60-80% of road users (freight transport operators and users) agreed that the EETS scope should be extended to include ANPR technologies to create maximum ease, accessibility and flexibility with tolling, compared to just 16-48% of toll chargers/service providers.
- Road users were strongly in favour (73-80%) of the Commission being involved in reviewing the merits of new electronic tolling systems, whereas respondents representing toll

infrastructure operators/service providers were strongly against this being adopted (between 40-83%).

Additionally, with regards to the question of whether the Commission should mandate information sharing across Member States for the purposes of toll recovery, opinions exhibited the opposite trend: road users, who are most likely to be affected by increased fines, were less in favour of this change (with up to 27% disagreeing) compared to toll infrastructure operators and solution providers who are most likely to benefit from increased toll recovery rates (only 4% disagreeing).

2.4 Task 2.4: Spontaneous Responses to Stakeholder Consultation

The following sections provide a high-level summary of the spontaneous contributions to the public consultation. The contributions provided information on a range of issues of relevance to electronic tolling systems, but only information relevant to this EETS report is presented below. Given that the spontaneous contributions did not follow any specific structure, the sub-sections included below relate to the most important discussion points raised.

Please note that the views presented can only be associated with respondents to this specific consultation and may not be representative of the views of all or specific groups of stakeholders.

2.4.1 Analysis of respondents' profile

The categories of organisations whose views were expressed in responses are referenced throughout the text below. Note however, that in some cases the stakeholder who submitted the contribution was not necessarily the author of the material submitted and in these cases we have referenced only the original author of the material submitted.

A total of 38 contributions were received, although eleven were of a more general nature and are not covered in detail below, while five were duplicates. The breakdown of the stakeholder categories submitting the responses that were analysed in detail is provided in Table 2-7.

Table 2-7: Stakeholder breakdown

Stakeholder Category	Number of responses
Tolling/motorway operators	9
Transport undertakings	9
Public authorities	4

2.4.2 The need for EETS amongst HDVs and LDVs

The need for EETS is centred on the benefits of interoperability. A motorway operator stated that interoperability is essential to establish a non-discriminatory road charging system that allows free flowing movement between Member States. The current situation shows a lack of interoperability across borders for HDVs, and within countries for LDVs, according to an ITS solutions provider. Both of these problems require all toll domains to be interoperable and non-discriminatory. The ITS solutions provider argued for the need for an EU legislative framework to ensure that toll domains are ready to receive EETS, and to provide rules for EETS providers to access markets of their choice. While Member States are capable of creating cross-border agreements, an EU-wide agreement is too complex for Member States without an EU-level legislative framework. A toll operator argued for a mandatory European framework for EETS, to address the differing levels of political will demonstrated by individual Member States. Another toll operator claimed that EETS would complement EU-wide toll harmonisation as it would minimise costs for users and enhance transparency of tariffs. A freight operator association supported the review of the EETS Directive and added that the Directive was positive for ongoing international transport.

However, one toll operator believed that implementation of EETS should be differentiated for Member States with existing toll roads and for those with no toll roads. Indeed, a Norwegian ministry suggested that HDVs and regional EETS solutions would be a good start on the way to full interoperability, arguing that HDVs profit most from the EETS service. A motorway operator also suggested that focusing on HDVs and areas with high HDV traffic would be a good start and would address market needs. This is similar to the views presented by a national trade association which stated that EETS would mainly provide advantages for internationally operating companies with big fleets, and would not be attractive to companies operating only within national markets. An international road users' association commented that EU harmonisation in general should focus on easy registration and payment, and should consider user friendly systems like automatic number plate recognition (ANPR) which does not require an OBU.

Regarding LDVs, a motorway operator suggested that the EU should introduce legislation to achieve interoperability for passenger cars. An employers' association argued that it was essential to establish a common and harmonised EETS system which should also be expanded to cars. Germany and France disagreed, arguing that the EU should not introduce legislation to achieve interoperability between electronic tolls for passenger cars, whilst an international road users' association suggested that, whilst EETS could improve HDV traffic, it should not be extended to LDVs.

2.4.3 Positive impacts

The positive impacts presented in the contributions received centre on interoperability, and the resulting shift to free flow tolling solutions which have social, economic and environmental advantages, according to a motorway operator.

According to an ITS solutions provider, EETS would benefit HDVs by reducing hauliers' paperwork related to contracts and invoices, would benefit private vehicles by providing interoperability within countries, and would benefit toll chargers by reducing the amount of OBUs needed by vehicles, thereby reducing the use of toll plazas which restrict traffic flow. A freight operator association also agreed that interoperability would avoid different OBUs for different tolls.

An international road users' association argued that EETS would allow motorists to use the same system to drive through all EU tolling areas, and enable timely and simple payment through electronic means, although non-electronic alternatives should be offered. They also suggested that the European Commission set a single standard and specification for road operators, and remove the need to have a bank account in a specific country.

2.4.4 Existing challenges

The contributions raised a number of existing challenges that must be overcome before EETS can be realised. Most of these focused on the barriers facing EETS providers in entering the market and meeting the requirements set in the Directive.

A national toll charger and a toll service provider suggested that the obligation to cover all toll domains within the first 24 months of service should be removed for EETS providers, whilst an ITS solutions provider stated that the obligation to cover all EU toll domains is too prescriptive. A toll service provider argued that this should be left to the rules of the market, allowing EETS providers to cooperate to fulfil this requirement. A national trade association claimed that this obligation is nearly impossible to achieve, and should be questioned. A motorway operator agreed with this, and suggested that removing it would allow more companies to enter the market. An employers' association agreed that the requirement to cover all domains should be phased out as this would lead to more competition and decisions about EETS services should be left to the needs of local markets. On the other hand, a German ministry argued that the requirement to cover all toll domains should be preserved, whilst France agreed but noted that the 24 month time limit could be removed.

Other issues raised include the following:

- A national toll charger argued that EETS removes the need for the public procurement process (toll chargers have to contract all interested and qualified providers, as long as they fulfil the toll domain specific requirements) and therefore toll chargers should be able to request contract negotiations with EETS providers. It noted that this process would add significant cost to both toll charger and EETS provider.
- A toll service provider commented on the risk of EETS providers going bankrupt or having severe financial losses and the disruption of service this would cause to end users. This problem requires the registration process to allow an evaluation of the financial position of EETS providers by all stakeholders involved. Furthermore, the toll service provider and a Norwegian Ministry suggested that a process should be defined to manage and define consequences in situations such as bankruptcy, if they arise.
- A toll service provider highlighted the lack of clear indication of interoperability constituents (any component on which interoperability depends) by EETS providers. The toll service provider recommends that interoperability components should be certified, but also accredited once for all EETS toll domains. Suitability testing of interoperability constituents should be left to the EETS providers, rather than as an added cost for toll chargers.

- A toll operator raised concerns that the costs of an EU wide service might not be compensated by the benefits that a common system would have. This would mainly be as a result of high investment costs as interoperability requires changes in the charging systems in place and complex administrative work to reach bilateral agreements with all stakeholders. Concerns were also raised over exclusivity conditions between provider and toll charger in some countries, and the cost of legal and concession agreement clauses.
- Several issues around transparency were also raised. For example, an international road users' association recognised the need for transparency, in order to allow acceptance and understanding by users. This would include transparent revenue earmarking, clarity of the system and the reasoning behind it, and long term consistency of the rules. Data protection issues should be considered before EETS implementation, keeping the scope of the data used and time it is kept to a minimum, and ensuring that the data is not used for commercial purposes. Additionally an employers' association and a German ministry agreed that the accounting system should be kept separate in the event that toll charger and toll service provider activities are performed by the same company in order to avoid conflicts of interest and to make costs transparent.

2.4.5 Views on the regulation of technologies

There is a wide range of technologies currently in place around Europe for electronic tolling, and the following responses discuss which of these should be allowed relative to the three technologies currently approved for EETS.

An ITS solutions provider commented that the limitation of technologies eases the introduction of EETS, and that the selected technologies (supplemented by video/ANPR) are well suited to cover all tolling scenarios. Furthermore, most Member States do comply with the three technology requirements, with the exception of Slovenia which uses RFID, while neighbouring country Turkey uses sticker tags on certain roads. An international road users' association also agreed that technology choices should be decided at a European level to avoid the need for multiple OBUs. However, several Member States also raised concerns that integration of EETS with other vehicle components would delay near-future deployment. The existing vehicle components that could be used (digital tachographs, eCall, odometer and tracking devices) have various legal or technical implications for EETS adaptability and addressing these would take time.

Conversely, a toll operator supported the EU policy stance in favour of technology neutrality in implementing EETS, arguing that there are many different possibilities for developing an interoperable solution within the current national systems, and stating the potential of the four mature technologies – satellite technology/GNSS, DSRC, RFID and video/ANPR. The use of RFID was discussed as it is very popular in the rest of the world with very low costs of implementation, despite not allowing for payment at high speeds. Video/ANPR tolling was also mentioned, but this would require Member States to share vehicle registration databases and agree on handling toll violations. Finally, the toll operator commented on the trends pointing towards alternative technologies in the near future, such as smartphones, V2V-V2I, and autonomous driving. To this point, they argued for the Commission to facilitate funding to support innovation and promote guidelines to suppliers, and also to amend the Directive to allow the use of additional tolling technologies, as these alternative options represent disruptive solutions in the near future. This view is shared by a motorway operator who argued for a comprehensive list of standardised technologies, without inhibiting innovation and adoption of new technology, by providing support for new trials. Furthermore, the motorway operator suggested that Member States should be allowed to choose the toll systems that best meet the network needs and characteristics.

Furthermore, a Member State business organisation, a motorway operator and an international road users' association all commented that EETS should be extended to systems based on automatic number plate recognition (ANPR), with the former giving the examples of e-vignettes and the London congestion charge. A German ministry disagreed, arguing that this technology does not require interoperable on-board units.

A Norwegian Ministry commented on the difficulty of collecting readings from the 5.8 GHz microwave frequency, as it is increasingly used by GPS, Wi-Fi and driver support systems. In light of this they suggested changing the frequency band for DSRC toll charging. On the other hand, a motorway operator argued that 5.8 GHz should be kept exclusive for transponders at toll facilities.

A Norwegian Ministry suggested that tests be carried out for the use of EETS equipment in the EETS domains. Requirements for this should be drawn up to include minimum functionality and testing processes, and the costs should be covered and regulated through an agreement between the toll chargers and the EETS providers. They also suggested linking EETS with other ITS solutions, and maintaining a dynamic outlook in the face of continuous technological development.

2.4.6 Reasons for lack of progress and proposed solutions

A number of contributors commented on the reasons for a lack of progress towards full implementation of EETS, but also provided suggestions as to how these obstacles could be overcome. Much of the discussion relates to increased EU regulations to assist entry to market for EETS providers.

There are a number of issues faced by EETS providers. An EETS provider highlighted the need for stable regulations across multiple markets, as EETS provider registration is currently based on local authority requirements, resulting in different verification processes in different toll domains. This point was also raised by a national trade association, which suggested there should be harmonised accreditation procedures for EETS providers to toll domains in order to reduce the costs and burdens they face. A motorway operator disagreed with this, and stated that toll chargers should remain fully in charge of certification within their toll domain, and that Member States and road operators should be responsible for accreditation. A German ministry acknowledged that the harmonisation of procedures for accrediting EETS providers, such as the certification of specific interoperability constituents, was desirable, but should not cover all procedures. France did not support the harmonisation of accreditation procedures.

An EETS provider also commented on the need for stable technology requirements before new technology is considered, due to the costs providers have already incurred in investing in technology. All contracts and technical details should be written and communicated in English, with the technical standards being binding, in order to achieve standardisation across the EU. This should apply to all aspects of the technology and process. For example, currently EETS providers have to ask for the most extensive proof of documentation in order to register users across multiple domains, as there is no common way to register trucks and some countries require much more proof than others. A toll service provider also commented that user registration needs to be simplified by using the minimum required information, normally the licence plate document.

It is too early to gauge the level of progress in cost of setup and maintenance, and the improvement of the internal market for E-fee collections, according to an ITS solutions provider. However, an EETS provider noted that EETS providers are subject to a number of additional costs that inhibit fair competition with national toll providers. These additional costs should be covered by the toll charger on behalf of the EETS provider, a point of view which was echoed by a toll service provider. A national transport ministry also commented on this, mentioning the need for warranties or insurances for outstanding moneys owed and settlement period regulations. The EETS provider suggested that national conciliation bodies should be formed to mediate between toll chargers and EETS providers to settle disputes based on differing points of views and interests. A national trade association suggested that conciliation bodies should have increased power to enforce the respect of the outcome of mediation. On the other hand, Germany and France argued that there was no need to increase the powers of the conciliation bodies.

A toll operator suggested that a limiting factor for progress amongst EETS providers was the high level of financial risk due to there being no guarantee of payment, no certification of procedures, and no common back office systems for all Member States. An ITS solutions provider agreed, suggesting that further standardisation is required in a number of areas including performance requirements, back-office communication, and toll domain statements. The toll operator recommended that the Commission ease investment requirements by reducing complexities. This could be achieved through clear certification rules and procedures for EETS, for example through a third party, and the creation of a clearing house for EETS, building on the association of toll chargers, service providers and financial institutions (similar to the system used in the Single Euro Payment Area (SEPA)).

A strong position is presented by a toll operator and motorway operator on the absence of a system for EU enforcement of toll payments, which adds further burden to EETS providers and increases the financial risk of implementing free flow technologies. A toll operator suggested that the EU Cross Border Enforcement Directive could include toll payments when it is evaluated in November 2016. A ministry, a national trade association and an employers' association suggested harmonised rules at the EU level

to recover unpaid tolls by creating a mandatory mechanism for the exchange of vehicle data on toll offenders. A motorway operator described enforcement as the key to interoperability and suggested that access should be given to all European motor vehicle databases to enable charging of non-residents and a shift to free flow solutions. However, a German ministry did not believe that there was a need to establish a mandatory mechanism for data exchange on toll offenders.

A toll operator suggested that a single European authority oversees Electronic Toll Collection. Such an authority could provide a single point of contact for EETS, to register EETS providers, as a conciliation body between EETS providers and toll chargers, as a clearing house for EETS to mitigate risk, and providing clear EU-wide enforcement to ensure payment across borders. This view was shared by an ITS solutions provider that stated that EETS would require a governing body, that specifies the requirements for EETS providers. An employers' association also argued for the European Commission to be given the authority to inspect planned infrastructure and for its decision to be binding on Member States; a German ministry disagreed, arguing that such decisions should remain with the Member State. The national trade association commented on the need for greater harmonisation of national tolling systems and procedures and that in order to achieve this, the EU should be given the right to scrutinise new EETS systems before they are deployed, and the EU position should be binding on Member States and road operators.

2.4.7 Other

A vintage car association noted that not all charging and payment systems would work with historic/vintage vehicles and this should be recognised to prevent an unfair disadvantage for the users of such vehicles.

France noted that the achievement of interoperability was a long and complex process, which was only possible if it was implemented in new projects, and so called for only marginal changes to the legislation at this point.

2.4.8 Addendum to Task 2.4

After the initial deadline for the ad hoc contributions, contributions were received from four additional organisations.

The French authorities argued that delivering complete interoperability was a long and complex process and that this was only possible if the rules were respected as new projects began. Hence, they called for the European Commission to be vigilant and argued that the existing legal framework should be kept stable, as this supports investors and secures ongoing investments. However, they are not opposed to marginal changes, including lifting the requirement to provide full coverage in all toll sectors within 24 months. Interoperability for cars is not considered to be a priority by the French authorities, as there is no issue, unlike with HGVs, with respect to the functioning of the internal market. On the other hand, they support the establishment of a mandatory European process for the exchange of the details of those who avoid paying tolls in order to ensure the equal treatment of all users across the EU. They support the Commission's role in providing advice to countries in the development of national toll systems, but would not want to give any more powers to the Commission in this respect. Finally, the French authorities would not be in favour of a harmonised accreditation system, if this were long, complex and potentially costly.

The Irish Department of Transport, Tourism and Sport supported the need to reduce the burden for EETS providers, particularly the existing requirement to provide full coverage in all EETS domains within 24 months. It also stated its support for measures to harmonise toll domain accreditation and for a mechanism to exchange vehicle registration data for the purpose of cross border enforcement.

A pan-EU business organisation agreed that there was a case for a "European framework for electronic interoperable distance and/or market-based charging", as long as this was consistent with certain principles. Principles of relevance to the EETS revision (the response also covered the Eurovignette Directive), included that infrastructure charging is non-discriminatory and applicable to all users, that interoperability between charging systems in different Member States is fostered and that charging should be cost-efficient, seamless, minimise administrative burdens and support the deployment of the latest technologies, including ICT.

A tolling company underlined that the revision of the EETS Directive should be based on market needs, building on regional approaches, such as REETS. It also noted that the objective of harmonising electronic toll systems should not inhibit innovation, thus it was important to strike a balance between

interoperability and the freedom of the operator. It considered cross-border enforcement to be an important element of an effective interoperable system, so there was an “urgent need” to enable toll companies to chase those who try to avoid paying tolls, no matter in which country they are based. It also noted that tolls were gaining in public acceptance, particularly with respect to environmental issues, and that technology would soon enable tolls to be used as efficient traffic management tools.

3 Annex C – Questionnaire for Task 2.2 Targeted Consultation

A. INTRODUCTION

This questionnaire forms part of the (stakeholder) consultation on the review of Directive 2004/52/EC and Decision 2009/750/EC on the European Electronic Toll Service (EETS). It targets stakeholders with a direct professional link to the electronic tolling market, and thus complements the questionnaire of the open public consultation (http://ec.europa.eu/transport/modes/road/consultations/2016-eets_en.htm).

Some of the questions are particularly aimed at a group of stakeholders who – by the nature of their business activities – have access to specific data or information. Where this is the case, it will be mentioned at the beginning of the question. Other respondents are however free to answer these questions as well.

Apart from section B, answers to the questions are to be provided in free text. Supporting material can be annexed to the answered questionnaire in a separate file. The answers should respect the numbering of the questions to facilitate their analysis. Respondents can answer in any official language of the EU, and answers in all languages will have the same value and be analysed in the same manner.

The responses to the targeted consultation will be published and the results will be presented in a public report. Respondents must clearly state it if they wish their answers to be treated anonymously (cf. first part of the questionnaire).

Answers (filled in questionnaires in word format) are to be sent to the following email address: move-d3-EETS@ec.europa.eu before 13 November end of the day.

B. ABOUT THE RESPONDENT

- (1) Please indicate your full name and, where applicable, the entity on behalf of which you participate in this public consultation
- (2) Please indicate, if applicable, the registration number of the entity in the EU Transparency Register
- (3) Please indicate your email address
- (4) Please indicate your country of residence/country of establishment of the represented entity
- (5) Please indicate the stakeholder group to which you belong, choosing from the list below (you can pick more than one):
 - (a) Public authority/administration
 - (b) Toll charger
 - (c) Toll service provider
 - (d) Toll system operator (playing the roles of both toll charger and toll service provider, e.g. Satellic in Belgium, Toll Collect in Germany, etc.)
 - (e) Road user (including associations of road users)
 - (f) Notified body
 - (g) Tolling equipment manufacturer
 - (h) System Integrator
 - (i) Standardisation body
 - (j) Consultancy
 - (k) Academia
 - (l) Industry association
 - (m) Other (please indicate)

(6) Please indicate whether you agree to the publication of your response.

a) Under the name indicated – I agree to the publication of all information in my response, except for my email address

b) Anonymously – I agree to the publication of all information in my response, except the replies to question 2 (name), question 4 (registration number) and question 5 (email address)

C. COVERAGE BY THE SERVICE

The legislation as it stands requires EETS providers to offer the European Electronic Toll Service to their clients in all EETS domains within 24 months from their official registration in their State of establishment. This requirement is often seen as excessive and even impossible to meet, given the great (and growing) number of EETS domains in the EU and the complexity of the accreditation and certification procedures. However, the removal of the requirement of universal coverage could potentially lead to "cherry picking", where the EETS would eventually never be offered in peripheral markets.

A number of solutions to the problem could be considered:

a) Completely remove the requirement to cover all EETS domains within 24 months

b) Keep the requirement to cover all EETS domains, but extend the deadline

c) Replace the full EU coverage requirement by the obligation to cover a certain, high percentage of EETS domains and/or Member States

d) Replace the full EU coverage requirement with an obligation to cover certain regional EETS domains and allow the coverage to be completed through partnerships with other EETS Providers

e) Replace the requirement to cover all EETS domains by the obligation to provide the service in the country of registration and all neighbouring countries

f) Other?

Question 1: Do you agree that the above-described requirement for EETS providers is a problem? If so, please give examples of its negative effects.

Answer:

Question 2: Please indicate your preferred solution to the problem (from the list above or other) and explain why. Please also rank the solutions considered according to your preference (1=preferred solution).

Answer:

D. ENSURING THE FAIR FUNCTIONING OF THE EETS MARKET

Today, EETS providers and toll service providers encounter problems of a legal, administrative, contractual and/or technical nature in accessing certain national markets. When access is sought, the contractual terms required sometimes, allegedly, do not adequately reflect the costs and risks of the parties, which undermines the viability of the EETS business model and thus discourages the provision of the service.

Alleged discriminatory practices and unfair contractual conditions are typically reported in the EETS domains where the roles of toll charger and toll service provider are played by the same entity. In such cases, it is difficult to compare the conditions offered to the operator of the toll system, on the one hand, and to the EETS provider, on the other hand, for the provision of the toll collection service alone. Several solutions to this problem could be considered, such as:

a) Defining, in the legislation, of the services for which EETS providers should be remunerated by the toll charger

b) Strict separation of accounts between the toll charger and toll service provider types of services

c) Strict separation between the shareholders of toll chargers and of toll service providers

d) Obligation for toll chargers to organise separate tenders for toll charger- and toll service provider types of services

- e) In case the tender contains a public service obligation (PSO) element, this element should be tendered out separately, or at least clearly delimited (separate remuneration) in the tender
- f) Right for the European Commission to issue an opinion on the tenders for the operation of electronic toll systems before they are published – this to spot elements of the tender which could be prejudicial to the fair functioning of the EETS market
- g) Enhance the powers of Conciliation Bodies (cf. article 10 of Decision 2009/750/EC for a description of the current role of these bodies), turning them into market regulators such as those existing in other fields (e.g. in rail transport, on the electricity market, etc.)
- h) Other?

Question 3 (for EETS providers and other toll service providers): Do you agree with the description of the problem of discriminatory/unfair contractual conditions for EETS providers? Please provide concrete examples of EETS domains where such conditions are applied.

Answer:

Question 4: Please rank the solutions listed above according to your preference (1=preferred solution) and explain your choices.

Answer:

E. REDUCING THE COST OF ELECTRONIC TOLLING AND OF THE EETS

Despite the existence of a large and coherent body of standards, electronic toll collection systems in the EU are still very different one from the others. Rather than copying existing, successful models, new schemes, more often than not, design the system architecture from scratch. This is alleged to increase the costs of development, deployment and operation of electronic tolling schemes, but also to increase the cost and level of complexity of providing interoperable toll collection services. Also, a lot of money could potentially be saved by Member States/toll chargers, if, instead of each developing their own systems, they co-operated to run a single one together. Such co-operation has so far happened only between the three Belgian regions, who decided to run together a system which covers the whole country.

The following solutions could be considered to address the problems described above:

- (a) Extending the standardisation effort, by developing more profiled standards and thus harmonising tolling schemes to a greater degree
- (b) Putting upon toll chargers additional obligations in their relations with EETS providers, such as the obligation to provide electronic maps in GNSS -based schemes, or to support the handling of EETS providers through a harmonised application profile
- (c) Harmonising the verification of conformity to specifications and of the suitability for use of interoperability constituents beyond what is currently provided for in Annex IV of Decision 2009/750/EC
- (d) Harmonising the procedure of 'accreditation' of the EETS provider to a toll domain
- (e) Supporting co-operation between toll chargers/Member States through the organisation of workshops, exchange of best practices and/or financial support
- (f) Other?

Question 5: Please give your opinion on the existence and precise nature of the problem described above.

Answer:

Question 6 (for EETS providers and other toll service providers): Please specify, to your best knowledge, examples of local specificities to electronic tolling systems which increase the setup and/or operation cost of the schemes, or constitute obstacles to the provision of EETS in the concerned toll domains. What are the most problematic elements (too restrictive KPIs, requirements stemming from differing national data protection rules, classification of tolls as charges or taxes, model of relationship between the toll charger and the EETS provider – 'reseller' or 'agency', lack of clear remuneration of EETS, risk cover when EETS is in charge of the toll calculation, other)? Please provide concrete examples, supported by background information and figures

Answer:

Question 7 (for public authorities, toll chargers and toll system operators): Please specify, to your best knowledge, examples of local specificities which constitute obstacles to interoperability, but are objectively justified by local characteristics or law.

Answer:

Question 8 (for public authorities, toll chargers): What are the main reasons preventing Member States/toll chargers from co-operating in the deployment of electronic tolling schemes? Are they mainly political (questions of national sovereignty over toll collection systems), legal, administrative, economic or other in nature?

Answer:

Question 9: Please rank the solutions listed above according to your preference (1=preferred solution) and explain your choices, including references to concrete examples, data and information

Answer:

F. COSTS OF THE LACK OF INTEROPERABILITY FOR ROAD USERS

The absence of interoperability between electronic tolling schemes in the EU has very concrete negative consequences for the road users. The most direct problem resulting from the lack of technical interoperability is the need to equip vehicles with several on-board units to be able to use the roads in different countries. However, the lack of an EETS results in other costs, affecting in particular small companies, such as administrative and accounting costs, fines linked to unintentional non-payment of tolls, traffic diversion to get a truck equipped, costs of installation, re-installation and servicing of OBUs, etc.

Question 10 (for haulage companies/road transport associations): Do you agree with the above description of the problem? Please support your answers with concrete examples, figures and statistics.

Answer:

G. CROSS-BORDER ENFORCEMENT

In the absence of common rules on the exchange of information on toll offenders between Member States and of a legal basis allowing toll chargers to enforce offenders once they are abroad, it is not uncommon that such offenders cannot be prosecuted, and unpaid tolls recovered, once the vehicle leaves the country. On average, losses from foreigners not paying their tolls amount to a small proportion of the road operator's revenues from tolls, but not chasing foreign registered offenders can be seen as unfair to compliant users. Furthermore, the problem can become significant on certain roads and toll domains, notably in vicinity of State borders and in free flow systems.

Using the technical solution currently used for the cross-border enforcement of road safety related offenses also for toll offenders appears to be the most obvious solution, but alternative approaches could also be considered.

Question 11 (for public authorities, toll chargers and toll system operators): Please indicate (and quantify to the possible extent), on the basis of your experience, the extent of the problem of toll avoidance by foreign registered vehicles, as compared to locally registered ones. Please differentiate between different kinds of vehicles (trucks, buses, light vehicles), different types of tolls (free flow, with barriers open/closed, vignette – paper/electronic), different types of roads, etc. What are, in your opinion, the main reasons for the violations (lack of awareness, specific difficulties in registering, lack of willingness to pay, other)? What solutions did you develop to limit the fraud? Which of these have proven to be efficient and which not?

Answer:

Question 12: Should the exchange of information, between Member States, on the identity of toll offenders be mandated by EU law, as is the case for road safety related offenses? Is the answer the same irrespective of the type of toll, of its classification in national law (charge or tax) and of the type of vehicle concerned? What should be the modalities of this exchange (e.g. should private toll chargers have access to such a system, or should the latter be limited to public authorities?)? What are the pros and cons of such a solution?

Answer:

Question 13: Does differing national law relating to the protection of personal data impede the cross-border enforcement of toll payments?

Answer:

Question 14: Do the currently differing national data protection regimes give rise to difficulties in the design of systems by EETS providers? If so, will the General Data Protection Regulation coming into force in 2018 improve the situation and how?

Answer:

H. NEW TECHNOLOGIES

With a progressing penetration of the market with smartphones, the question arises as to the possible use of these devices for tolling. Integration of OBUs with other devices built in the vehicles (navigation tools, enforcement tools such as the smart tachograph, commercial telematics devices) is also regularly considered.

Question 15 (for equipment manufacturers, toll chargers, system integrators and toll service providers): How could electronic tolling potentially develop over the upcoming ten years? What changes to the EU legislation would be needed to foster welcome market developments in this respect (and, similarly, to protect the market from unwanted risks)?

Answer:

Question 16 (for equipment manufacturers, toll chargers, system integrators and toll service providers): Are there other technologies that are proving or may prove to have potential for development in the European market that are worth being considered when revising the EETS legal framework?

Answer:

I. LIGHT VEHICLES

Current legislation on the EETS applies non-distinctively to heavy duty (trucks, buses) and light vehicles (cars, vans). This is disregarding the intrinsic differences between these two segments of the market: trucks tend to cross borders much more often than cars; car drivers have worse knowledge of the regulations applicable abroad than professional truck drivers; there are no GNSS-based tolling systems for cars (but an EETS provider for cars must still offer a GNSS OBU, according to the legislation in place); at the same time, many electronic tolling systems for cars are using the automatic number plate recognition (ANPR) technology, etc.

In order to reflect the above-mentioned differences, the following adaptations to the EU legal framework on EETS could be considered:

- (a) Excluding light vehicles from the scope of the legislation
- (b) Having a number of specific rules for the EETS covering light vehicles, such as:
 - i. No requirement for a GNSS-OBU
 - ii. Inclusion of ANPR-based systems
 - iii. Allowing the use of RFID or emerging technologies for local tolling of light vehicles: urban city tolling, bridges or tunnels
 - iv. Other?

Question 17 (for toll service providers, toll chargers and road transport associations): Please give your opinion on the differences between the EETS markets for heavy duty- and light vehicles. In particular, please indicate if in your opinion there is a market for EETS for light vehicles, and under what conditions. Please be specific in your answers and support them with references to concrete examples, data and information.

Answer:

Question 18: Please rank the solutions (including sub-solutions) listed above according to your preference (1=preferred solution) and explain your choices, including references to concrete examples, data and information

Answer:

J. OTHER

Question 19: Please indicate any other comments or recommendations which you would like to make in the framework of this consultation.

Answer:

K. APPENDICES

Please attach any documents to support your answers. The documents must be numbered and clearly referenced to facilitate their analysis in conjunction with the answers to the questionnaire

4 Annex D – Full list of interviewees for Task 2.6

Contact		Interview Progress					Subtasks covered									
Name	Organisation	Initial contact	Further Follow Ups	Follow Up Notes	Interview Type	Interview Held	T1.2	T1.3	T1.4	T1.5	T1.6	T1.7	T1.8	T1.9	T1.10	
Jérôme Lejeune	Axxès	21/10/16	1		In-person	Yes			1	1			1	1		
Gérard Baranczak	Axxès	21/10/16	1		In-person	Yes			1	1	1		1	1		
Alenka Košic	Dars	21/10/16	1		Telephone	Yes		1	1				1			
Edward Hirst	Qfree	26/10/16	2 or more		Telephone	Yes		1	1	1		1				
Ulrik Janusson	Kapsch	26/10/16	1		Telephone	Yes	1					1				
Frederic Keymeulen	European Road Haulers Association	21/10/16	1		Telephone	Yes	1		1							
Malcolm Bingham	FTA	21/10/16	2 or more		Telephone	Yes	1		1							
Rémi Lebeda	International Road Transport Union	21/10/16	1		Telephone	Yes	1		1							
Jochen Lux	Bundesbeauftragte für den Datenschutz und die Informationsfreiheit (BFDI)	17/11/16	1		Telephone	Yes									1	
Peter Büttgen	Bundesbeauftragte für den Datenschutz und die	17/11/16	1		Telephone	Yes									1	

Contact		Interview Progress					Subtasks covered									
Name	Organisation	Initial contact	Further Follow Ups	Follow Up Notes	Interview Type	Interview Held	T1.2	T1.3	T1.4	T1.5	T1.6	T1.7	T1.8	T1.9	T1.10	
	Informationsfreiheit (BFDI)															
Jesper Engdahl	Rapp Trans (Uk) Limited	26/10/16	1		Telephone	Yes						1				
Valérie Dumerc	Asecap	24/10/16	1		Telephone	Yes			1	1	1	1	1	1		
Johan Schoups	Viapass	Early october	1		In-person	Yes	1	1	1				1	1		
Agency representatives	Road agencies of Albania, Bosnia, Kosovo, Macedonia, Montenegro, Serbia	03/11/16	1		In-person	Yes		1	1				1	1		
Thomas Pferr	Satelllic NV	Early october	1		In-person	Yes	1	1	1				1			
Kamil Potrzuski	Satelllic NV	Early october	1		In-person	Yes		1					1			
Bruno De La Fuente	Seopan (former Executive Director of Aseta)	20/10/16	1		Telephone	Yes			1	1			1			
Michael Blum	Toll Collect	21/10/16	1		In-person	Yes	1	1	1				1			
Sjoerd Boot	Transport en Logistiek Nederland	21/10/16	1		Telephone	Yes	1		1							
Valérie Dumerc	ASFA (France)	24/10/16	1		Telephone	Yes			1	1	1	1	1	1		
Alexander Klacska	KLACSKA group	10/11/16	1		Telephone	Yes	1									

Contact		Interview Progress					Subtasks covered									
Name	Organisation	Initial contact	Further Follow Ups	Follow Up Notes	Interview Type	Interview Held	T1.2	T1.3	T1.4	T1.5	T1.6	T1.7	T1.8	T1.9	T1.10	
Bart Weekers	Belgian conciliation body	11/11/16	1		Telephone	Yes				1						
Lorenzo Bas	Bas Group B.V. (www.bas.eu)	17/11/16	1		Telephone	Yes	1									
Gertjan van der Most	Van der Most Transport BV	22/11/16	1		Written	Yes	1									
Tadeusz Wilk	Polish International Road Hauliers Association (Zrzeszenie Międzynarodowych Przewoźników Drogowych)	25/11/16	1		Telephone	Yes	1									
	K.Motiejausko TPJ	28/11/16	1		Written	Yes	1									
Zach, Thomas	Rüdinger Spedition GmbH	FTA contact	1		Written	Yes	1									
Pulleyn	Anonymous	FTA contact	1		Written	Yes	1									
TrAm	Anonymous	FTA contact	1		Written	Yes	1									
FbN	Anonymous	FTA contact	1		Written	Yes	1									
Jelena Makmak	Baltic Line	28/11/16	1		Telephone	Yes	1									
Dieter Verhaeghe	Belgium DPA	01/12/16	1		Telephone	Yes									1	

Contact		Interview Progress					Subtasks covered								
Name	Organisation	Initial contact	Further Follow Ups	Follow Up Notes	Interview Type	Interview Held	T1.2	T1.3	T1.4	T1.5	T1.6	T1.7	T1.8	T1.9	T1.10
Bruno Launois	EUROWAG	25/11/16	1		Telephone	Yes				1				1	
Hubert Resch	ASFINAG	31/10/16	2 or more		Telephone	Yes			1	1		1	1		1
Jorge Cunha	Via Verde	21/10/16	1		Telephone	Yes	1		1	1	1		1	1	
Eva Tzoneva	AETIS	25/11/16	1		Telephone	Yes				1				1	
Robin Paillaret	Axxès	25/11/16	2 or more		Telephone	Yes				1				1	

5 Annex E – Interview scripts used in consultation for Task 2.6

5.1 Subtask 1.2

Subtask 1.2: Cost and hassle caused to road users by the lack of interoperability of electronic tolls		
Estimation of your direct costs implied by the use of On Board Units (OBU) in the different road network your trucks are using.		
Question	Must Have / Prompt	Answer
How many OBUs per truck are you required to be equipped with on average for operating your activities across the EU territory?	Number? Estimate? Average per truck?	
<p>Please list the different OBUs and specify whenever possible, for each one:</p> <ul style="list-style-type: none"> the corresponding toll domain(s) the corresponding deposit amount or the price you are required to pay in case you don't return the OBU the shipping cost for returning the OBU after use (when shipping is the only option) the approximate share of units for which the deposit is not refunded (either because you are willing to keep the OBU long term or because of operational problems with OBU) the approximate share of units which are fixed installed in trucks (i.e. having required a technical intervention and not only plugged to the cigarette lighter socket) the approximate share of units which are long term installed (i.e. not removed before at least 6 months) (whether fixed installed or not) 	<p>Countries?</p> <p>Estimate? Scale "€€", "€€€", "€,€€€?"</p> <p>Between 5-10%?</p> <p>20-30%?</p>	
<p>For the OBUs requiring a fix installation (or for which a fix installation is chosen), are you able to specify for each type of OBU?</p> <ul style="list-style-type: none"> the total cost of installation per OBU (i.e. amount charged by the installer, as well as all related costs such as logistics costs) the time spent for the installation (i.e. total immobilization time of the truck) the time spent by company employees (most likely truck drivers) for the installation (e.g. waiting time, during which the truck driver cannot drive) 	<p>Estimate? Scale "€€", "€€€", "€,€€€?"</p> <p>Who would know?</p> <p>Do we want a monetary figure here too?</p>	
<p>Do you offer a specific training for your drivers to use the OBU? If yes, could you please specify:</p> <ul style="list-style-type: none"> the time spent for the training for each type of OBU 	Estimate, scale, between?	

<ul style="list-style-type: none"> the possible side costs of a training (e.g. trainer cost, training material) 		
<p>Are you required to pay service or subscription fees for some toll domains or with some ETS providers? If yes, please precise which and the approximate level of fees (macro figures).</p>	<p>Estimate? Scale “€€”, “€€€”, “€,€€€”?</p>	
<p>Estimation of your administrative costs, implied by the management of tolling related matters.</p>		
<p>1) Management of the fleet of OBUs (e.g. ordering OBUs and managing OBU order/logistics, registering new OBUs, update of OBU data, managing claims related to OBUs or related contracts)</p>	<ul style="list-style-type: none"> briefly describe the nature of the activities performed for tolling related matters, specify the human resources and the tools involved to perform the activities, evaluate the cost of the activities, both in terms of resources (i.e. Full Time Equivalents x labour cost rate) and of system (e.g. specific tools developed, dedicated licenses)? 	
<p>2) Accountability & invoicing</p>	<ul style="list-style-type: none"> briefly describe the nature of the activities performed for tolling related matters, specify the human resources and the tools involved to perform the activities, evaluate the cost of the activities, both in terms of resources (i.e. Full Time Equivalents x labour cost rate) and of system (e.g. specific tools developed, dedicated licenses)? 	
<p>3) Reporting and other compliance activities</p>	<ul style="list-style-type: none"> briefly describe the nature of the activities performed for tolling related matters, specify the human resources and the tools involved to perform the activities, evaluate the cost of the activities, both in terms of resources (i.e. Full Time Equivalents x labour cost rate) and of system (e.g. specific tools developed, dedicated licenses)? 	
<p>4) Others</p>	<ul style="list-style-type: none"> briefly describe the nature of the activities performed for tolling related matters, specify the human resources and the tools involved to perform the activities, evaluate the cost of the activities, both in terms of resources (i.e. Full Time Equivalents x labour cost rate) 	

	and of system (e.g. specific tools developed, dedicated licenses)?	
Estimation of your costs, implied by undue fines.		
Could you provide an approximate average of the cost of fines charged to your company in one year due to errors in manipulation of OBUs or stemming from other management or system malfunctions?	Note: the aim of this question is to evaluate the indirect cost stemming from the complexity of the current situation.	
Final qualitative questions		
What are the benefits of subscribing services with an EETS provider?		
What are the drawbacks?		
What are your expectations regarding the evolution of the European tolling directives?		

5.2 Subtask 1.3

Cost categories	Processes	Cost items	Cost "as is"	Possible savings if acceptance of external OBUs	Possible savings if shared systems & processes	Additional possible savings via services offered by EETS Providers
OBU Management	Providing to the users and personalizing the OBU for toll collection	OBU purchase				
		OBU logistics				
		OBU personalization (for local use / for use abroad)				
	Operating the Front-End for toll purposes and taking care of the aftersales service of the OBU	Distribution network costs				
		OBU failure process management				
Infrastructure & technologies	Build	System (capex)				
		Labour cost: IT (BA, dev, maintenance...)				
	Run	System (opex)				
		Labour cost: IT (BA, dev, maintenance...)				
Admin & Back office	Managing the contractual relation with the users: signing the subscription contract, explaining the toll scheme, helping for registration where required, pre-	Labour cost: customer service operator				
		Labour cost: admin operator				
		Communication media (user manuals...) - including international communication				
	Invoicing and collecting the toll fees from the users	Labour cost: admin operator				
		Labour cost: perf monitoring				
	Managing claims	Labour cost: admin operator				
	Labour cost: customer service operator					
Enforcement						
Risks & Finance	Managing financial and operational risks	Financial impact of the bank guarantee (interests)				
		Insurance premium				
Marketing & Communication	Conducting the necessary information work towards users and authorities	Labour cost: marketing & communication resources				
		Communication media (user manuals...) - including international communication				

5.3 Subtask 1.4

Subtask 1.4: Quantity in monetary terms the costs of toll evasion for toll chargers due to the lack of co-operation between Member States on cross-border enforcement		
Questions for private toll recovery agencies		
<i>Question</i>	<i>Must Have / Prompt</i>	<i>Answer</i>
Which countries or private toll operators are you contracting with?		
Who are the other players on the market in Europe?		
In your opinion, what are the key catalysts for toll fraud in the EU?		
Do you have an idea of the scale of toll evasion stemming from vehicles registered in EU states vs. non-EU states?		
Do you know which European countries have bilateral or multilateral agreements on the exchange of vehicle registration data with the purpose of recovering unpaid tolls?		
Could you provide us with a general picture of your operating model for toll recovery services?		
What is the average recovery rate? Are there significant differences from one country to another?		
What is the cost for the client (i.e. toll charger)?		
Questions for Toll Chargers		
How do you consider toll evasion? Is it a major topic for you?		
Could you provide the amount of unpaid toll by users registered abroad and from users registered in your country?		
Taking into account the paid fines, what is the rate of toll collection?		
What are the main categories of violations?		
Do you rely on private companies to recover unpaid tolls from vehicles registered abroad? If yes, could you please specify:	<ul style="list-style-type: none"> oHow many companies are you contracting with? oWhat are the operating and contractual principle of this relationship? (a.o. what costs it implies for you?) oWhat is the effectiveness of the toll recovery via these companies? 	
Questions for Transport companies or associations		
What is your experience with foreign countries requesting you/your members the payment of a toll (due or undue)?		
What is your experience with private toll recovery agencies?		

Are you aware of bilateral or multilateral agreements between member states specific to toll?		
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5.4 Subtask 1.5

Subtask 1.5: legal barriers to entry to the toll collection market		
National legislation in the Member States ('MSs') in which you are operating or are considering operating		
<i>Question</i>	<i>Our preliminary comments</i>	<i>Discussion</i>
Is there legislation in the MSs in which you operate or are considering operating which has the effect of impeding EETS providers from entering the market?	Thus far we have not found examples of impediments to EETS providers stemming from national legislation.	
For example, does any relevant national legislation or regulation require EETS providers to cover all toll domains in the EU within 24 months failing which their registration in that MS can be revoked?	Some in the industry consider the requirement in the Directive and Decision for EETS coverage in all MSs to be over-burdensome and restrictive. Is this provision incorporated in national law in some MSs and, if so, is it discouraging new entrants?	
Are any other restrictions applied to current or prospective EETS providers by national legislation or regulation?	We are looking here for any other local laws or regulations that put unreasonable obstacles in the way of potential EETS providers.	
Do the relevant authorities in different MSs interpret the requirements for registration as an EETS provider and accreditation differently and does this increase the length of time, and cost, involved in entering the market?	One of the current EETS providers, AGES EETS GmbH, needed over a year to complete registration. It blamed in part the imprecision of the requirements of Art.3 of the Decision leading to differing national interpretations.	
In some MSs is the requirement in Art. 5.3 of the EETS Decision, that the toll charger should accept on a non-discriminatory basis any EETS provider, interpreted as meaning that the toll operator must not discriminate between EETS providers rather than that the toll operator should not discriminate against any EETS providers by, for example, demanding unjustifiable contractual terms?	Any experience of this argument being raised?	
Contractual barriers to entry to the market		
Are you aware of contractual terms being sought by toll operators to which EETS providers find it difficult or costly to agree? Are such terms also applied in contracts with local or regional electronic tolling service providers or is there in	We would like to discuss, for example, instances where the remuneration terms offered to EETS providers do not reflect their greater service costs as compared to the costs of purely national service providers or card issuers.	

effect discrimination against new EETS entrants? If so, please give examples		
Are you aware of any instances where the technological requirements of particular electronic tolling systems have been given as a reason for not contracting with certain EETS providers? If so, can you give examples of justifiable as well as unjustifiable reasons?	We understand that new entrants can be handicapped by delays in providing necessary technical information and by TCs failing to facilitate interfaces with EETS providers that they have already established with national providers.	
Are you aware of any instances where the terms of the concession given to toll operators in practice restricts their ability to contract with EETS providers? Are exclusive and long-duration concessions between national authorities and particular toll operators keeping potential EETS providers out of those markets?		
Do potential EETS providers face particular difficulties in MSs that have already given the operation of the tolling system, enforcement and collection of tolls to a single company?		
Are EETS domain statements useful to potential providers? Would it be feasible to have model contracts annexed to them and would that be helpful to potential EETS providers?		
Do toll operators requirements for guarantees covering toll payments vary and are some much more demanding than others to provide? Is it common for toll operators to demand pre-payment of tolls from EETS providers?		
Where toll chargers already have electronic service providers is it difficult to judge whether terms sought from new EETS providers are discriminatory? For example, does the remuneration of an existing service provider sometimes cover more than the collection of tolls, thus preventing any direct comparison with the remuneration terms being offered to potential EETS providers?	It would help us to discuss your experience of tenders by TCs to EETS providers and how the comparability of services, and of the terms offered, can be judged against what is offered to other service providers, e.g. national or local ones.	
More general legal issues		
If you consider that there are currently legal discouragements to potential EETS providers related either to national legislation or regulations or to contractual terms that toll operators seek to impose, do you anticipate any changes that may affect this?	Is the current evolution of the market encouraging?	
In the MS in which you operate, or are considering operating, have conciliation bodies been established to resolve, inter alia, disagreements between toll operators and EETS providers as to the fairness of contractual terms sought by either party? If not, do you consider such bodies would be effective and helpful in ensuring that toll operators' contractual conditions do not distort competition by handicapping potential EETS providers?	We would like to discuss any experience or knowledge you have of the way conciliation bodies operate and their effectiveness. Are their powers too limited to ensure fair play or is there too little experience of them as yet to give an opinion?	

5.5 Subtask 1.6

Subtask 1.6: Assess the technological and procedural differences between existing (and/or upcoming) electronic tolling systems and their impact on the achievement of interoperability and the provision of an European Electronic Toll Service		
Questions (for EETS Providers)	Must Have / Prompt	Answer
What are for you the main technological obstacle for you in entering the different European markets?	<ul style="list-style-type: none"> • Specific technical requirements • System legacy 	
What are for you the main procedural obstacle for you in entering the different European markets?	<ul style="list-style-type: none"> • Time of accreditation process • Costs • Liabilities 	
What should be, in your opinion, the evolutions in that field?	<ul style="list-style-type: none"> • EU-wide binding harmonized technical requirements • EU-wide binding harmonized procedural requirements 	

5.6 Subtask 1.7

Subtask 1.7: Assess remaining gaps in the standardisation framework		
Question	Must Have / Prompt	Answer
Please describe the standardisation of the electronic toll collection systems in Europe, along with the technologies that are currently referred to by the EU Directive for Interoperability and the EETS Decision?		
Please provide us with an overview of all the standards that have been published (within ISO, CEN and ETSI), and which standards are currently being developed and/or to be developed in the near future?		
<p>We believe that the technical standardisation in Europe has produced first a set of general purpose standards, enabling different types of implementations in accordance with the specific requirements and context. Only recently (e.g. with the standard EN 15509 for the 5.8 GHz DSRC-based tolling) the focus moved to the development of application profile standards defining - with as few option as possible - the way harmonised implementations can be realised; would you please provide us what - in your understanding - must be still done in order to define harmonised application profiles for:</p> <ul style="list-style-type: none"> o DSRC-based tolling applications o GNSS-based tolling applications 		

o DSRC-based enforcement applications		
Do you think that nowadays application profiles for the above three types of implementations have been fully defined or there is still work in progress and/or to be done to ensure full interoperability among systems?		
The focus on the main technical standards are expected to provide the basis for interoperability across the interfaces between "Interoperability Constituents" as defined within the EETS Decision. Can you please provide us with your understanding on whether the existing/upcoming standards sufficiently specify such interfaces and/or such standards are still open enough to allow non-interoperable implementations?		
Keeping in mind the need to achieve a set of technical standards for fully interoperable systems to be implemented and operated, which are in your understanding the issues/standards on which you think that the standardisation bodies should prioritise?		
Are there activities aiming at the development of technical standards in areas that - although not covered by the EETS legal framework - fall in the overall electronic tolling perimeter (for example use of ANPR technologies)?		

5.7 Subtask 1.8

Subtask 1.8: Provide a comparison of the practices of accreditation of EETS providers, and identify best practices		
<i>Questions (for Toll Chargers)</i>	<i>Must Have / Prompt</i>	<i>Answer</i>
Could you please describe the process	<ul style="list-style-type: none"> • Main steps (e.g. certification of OBUs, suitability for use, test blocks) • Timeline (with possibility of parallel work) • Key actors on your side (e.g. internal experts, external experts, private sector actors) • Key deliverables you are requiring from the candidates 	
What kind of KPIs do you use to evaluate the candidates?		
What material are you putting at the disposition of the candidates, before and during the process?	<ul style="list-style-type: none"> • Format of the requirement? • Test plans? 	
What is average cost of the process for the candidate?	<ul style="list-style-type: none"> • Fix costs (e.g. fees) • Labour costs involved • Equipment costs involved 	

5.8 Subtask 1.9

Subtask 1.9: various impacts caused by differing legal classification of tolls		
Whether under national legislation in the MSs toll are classified as taxes or as service payments		
Question	Must Have / Prompt	Answer
Does the allocation of revenue from tolls by national authorities (for example, whether it is specifically dedicated to roads or goes for wider purposes) complicate the adoption of EETS?		
Does classification of tolls as taxes under national law in some MSs significantly increase costs and administrative burdens for toll operators?		
Does classification of tolls as taxes under national law in some MSs significantly increase costs and administrative burdens for EETS providers? Do differences between MSs increase these burdens for a pan-European provider?		
How does liability for VAT if tolls are regarded as service remuneration, contrasting with the absence of VAT where they are classified as taxes, affect EETS providers covering toll domains throughout the EU?		
Does the legal classification of tolls impact the choice of business models for EETS providers? For example, does this affect whether the EETS provider is regarded as an agent of the toll operator or the direct provider of a service to the toll paying customer?		

5.9 Subtask 1.10

Subtask 1.10: Data Protection Concerns		
National legislation in different Member States		
Question	Must Have / Prompt	Answer
<i>Do the currently differing national data protection regimes give rise to difficulties in the design of systems by EETS providers and, if so, will the General Data Protection Regulation coming into force in 2018 improve the situation?</i>	<i>It should be explored whether the data protection regulation led to any changes in how current tolling providers operate. Also the relationship between national legislation and the national implementation of 2002/58/EC (privacy in regard to electronic communication) shall be explored.</i>	
<i>Which data is collected for electronic tolling purposes?</i>	<i>It is necessary to ask which data needs to be collected by EETS providers according to the applicable legislation. I assume in most cases two types of data will be collected: normal personal data (such as name of the driver, number plate, etc.) and location data (knowing the location of the car/driver will be important to calculate the toll amount). Location data is regarded as a special category of data under Dir. 2002/58/EC</i>	

	<i>It would be interesting to also ask whether the different data sets will be treated differently when it is further processed (e.g. are some data categories deleted earlier than others?, etc.)</i>	
<i>How is the data collected, stored and used?</i>	<p><i>Ask about the equipment and procedure applied to collect data.</i></p> <p><i>It is important to know whether only data necessary for the payment of the toll is collected or whether more data than needed is collected (e.g. because it is technically not possible to minimize data collection).</i></p> <p><i>If so what happens to the data which is not essential for tolling purposes?</i></p> <p><i>It is also necessary to figure out how long the data is stored and whether some data is stored longer than other data? Is data permanently deleted after the storing period is over or is it just rendered anonymous?</i></p>	
<i>Can data collected for tolling purposes also be used for other purposes?</i>	<p><i>For example in Germany, it is not possible to use data collected for tolling purposes for other purposes, such as crime investigation. It would be interesting to know whether in other countries this is possible.</i></p> <p><i>In case data can be used for other purposes, it is also necessary to ask the interviewee which safeguards regulate the access of third parties to the data (e.g. is a decision by a judge necessary).</i></p>	
<i>Which data security safeguards exist in respect to the EETS system?</i>	<i>Data Security refers to the technical protection of data. It needs to be explored whether adequate data security safeguards are in place that take the vast amount of data into account.</i>	
<i>Does the national tolling system foresee the exchange of data with other Member States for the purpose of enforcing toll payment from vehicles registered in another Member State?</i>	<i>Annex (m) of Directive 2004/52/EC mentions the possibility of harmonising the rules of enforcement relating to electronic road tolls. It would be interesting to know whether Member States already exchange data for the purpose of enforcing toll payment.</i>	
<i>Which procedure is applied when data is exchanged between Member States for the purpose of enforcing toll payment from vehicles registered in another Member State?</i>	<p><i>Does the national system allow for this type of data exchange?</i></p> <p><i>If so which procedure is followed? (e.g. who makes the request for data? who sends the data? Which safeguards are applicable if data is send from one Member State to the other?)</i></p>	
<i>Which difficulties occur when data is exchanged between Member States?</i>	<p><i>Are there compatibility problems when data is transferred?</i></p> <p><i>Is the “data minimisation principle” complied with (e.g. how to ensure that only data which is necessary is exchanged, etc.)</i></p>	