

# EUROPEAN ELECTRONIC TOLLING INTEROPERABILITY

ABERTIS POSITION PAPER  
DECEMBER 2015





# CONTENT

04

Executive Summary

---

14

Recommendations

---

06

Electronic Toll collection:  
The Abertis Experience

---

15

Conclusions

---

07

EETS Model: Pillars for a  
successful implementation

---

16

References

---

08

Operational aspects

---

10

Technological aspects

---

11

Financial aspects

---

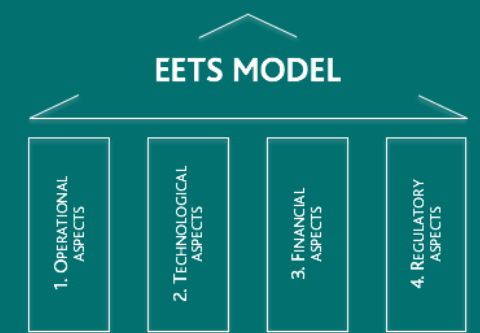
12

Regulatory aspects

---

# EXECUTIVE SUMMARY

This paper analyses the situation of electronic tolling interoperability in Europe, and makes recommendations based on Abertis know-how as a market leader in toll road management. The document looks at the obstacles and solutions found by Abertis for extending the use of Electronic Toll Collection (ETC), and at the reasons behind the difficulties in designing a fully interoperable solution within the EU. It concludes that a successful implementation of the European Electronic Toll Service (EETS) needs to be modelled on a holistic approach. This paper looks at the main elements that, according to Abertis experience, such an approach needs to encompass: operational, technological, financial and regulatory aspects, and makes a final set of recommendations based on it.



Abertis is the international market leader in the management of toll roads, with more than 50 years of experience in the tolling market and with a strong presence in France and Spain. Abertis has a total network of 3.200 km in the EU alone, reaching 8.300 km of highways worldwide. This gives us a solid experience in toll management with different technological platforms, in different Member States and their borders. Moreover, Abertis has a dedicated business unit which designs, implements and operates state-of-the-art road pricing

solutions across the world. Abertis ETC systems are compatible with the European standards and interoperable at the regional level, for instance, in the borders between Spain and France, Spain and Portugal, and with other non-bordering Member States. Abertis Business Units have participated actively in several EU funded project related to EETS deployment, such as CESARE<sup>1</sup>, PISTA<sup>2</sup>, RCI<sup>3</sup> and REETS<sup>4</sup>, among others.

Abertis advocates for a harmonised modular toll system based on distance travelled and applied to all vehicles. This is in line with the European Commission efforts to promote a standard system of road charging related to distance travelled, in application of the user-pays, polluter-pays principle. In this context, the Commission's intention to act on "Fair and efficient pricing for sustainable transport – revision of the Eurovignette Directive and framework to promote European electronic tolling<sup>5</sup>", presents a clear opportunity to foster greater levels of harmonisation across Member States. However, it appears clear that EETS deployment remains an issue, mainly because the right incentives are not in place to ensure its application throughout the European road network.

There have been several European projects trying to find a technological solution for interoperability; in this paper we advocate for a more customer oriented approach. The shortage of demand to support the costs of developing or acquiring On Board Units (OBUs) with payment facilities, and the financial, regulatory and technological risks associated to EETS deployment are barriers that cannot be overcome in the current conditions. Abertis has experienced first-hand the difficulties in bringing down these barriers. Abertis supports the efforts of the Commission in fostering harmonisation in the construction of a Single European Market, but a more holistic approach is needed in the path to digitalisation of the tolling systems.

The Eurovignette<sup>6</sup> and the EETS<sup>7</sup> Directives are much welcome initiatives in the right direction. Despite the apparent fragmented nature of road user charging in Europe, significant progress has been made since 1995. However, it is needed more coordination throughout the EU transport network to achieve a more efficient and effective way to charge for the construction and maintenance of the infrastructure, as well as for the internalisation of external costs.

We share Commissioner Bulc's approach towards combining the complete interoperability of tolling systems with an effective implementation of the user-pays and polluter-pays principles and in this context we stand ready to work towards a balanced and sound revision of the EETS Directive. We believe there are many lessons to be learnt from previous success stories in different fields, the development of eCall, SEPA and CrossBorder Enforcement systems constituting illustrative examples to what can be achieved at the EU level.

In this line, a compulsory EU harmonised modular toll system applied to all vehicles would prove the best system to effectively implement EETS for the benefit of EU citizens. The extension and harmonisation of road charging would allow for compensation of part of the many costs associated to interoperability. Moreover, we believe that it

would promote efficiencies in the transport sector, as well as its competitiveness among all Member States. Thus it would support the efforts towards decarbonisation of transport and remove trade barriers through the right pricing signals.

This solution should be accompanied by other measures directed to tackle other challenges of the EETS model. A "clearing house" system should be promoted to mitigate financial risks which together with better enforcement mechanisms would help guarantee payments. In this sense, the EU Cross Border Enforcement Directive<sup>8</sup>, currently with a limited list of traffic offense, can be a good approach for implementing stronger enforcement mechanisms that would facilitate the application of the user-pays and polluter-pays principles. Finally, it would be also advisable to establish different transition periods for Member States with legacy systems and those who do not have toll roads nowadays, and to put in place technological guidelines that meet the requirements of the different stakeholders.

In conclusion, a viable business case is needed for a successful EETS, supported by all stakeholders. We also advocate for the Commission to organise high level expert groups in order to advance in parallel with the pillars that will help conform the EETS.

# ELECTRONIC TOLL COLLECTION: THE ABERTIS EXPERIENCE

In 2015, EU Member States are levying road user charges on private vehicles in fifteen Member States and on heavy goods vehicles in twenty-four. In total, the tolled road network is approximately 72,000 kilometres long of which 60% is equipped with electronic toll systems. However, it is interoperable mostly only at a national level. According to ASECAP (European Association of Tolled Motorways, Bridges and Tunnel Concessionaires) ETC subscribers reached 30M in 2015, but, despite some national and regional interoperability, there is neither a single contract nor a single On Board Unit (OBU) to use on the entire European network. It appears clear that EETS deployment remains an issue, as the right incentives are not in place to ensure its application throughout the European road network.

Abertis ETC systems are compatible with the European standards and comply with Decision 2009<sup>9</sup> requirements, such as the Toll Domain Statement. Moreover, toll payments are possible through credit cards and cash in all toll plazas, both in automated and manual booths, guaranteeing free and safe movement of vehicles throughout our EU network. Abertis has been working on the implementation of interoperable solutions at the regional level. For instance, toll systems are already managing interoperable transactions for border crossing between Spain and France, between Spain and Portugal, and with other non bordering Member States. Abertis Business Units have

participated actively in several EU funded projects related to EETS deployment, such as CESARE, PISTA, RCI and REETS, among others.

These solutions have been put in place with the participation of different toll road operators and technological partners through regional agreements. The practical project implementation has been long and burdensome; projects took on average 24 months, involving several players from different Member States and requiring technological development both in toll systems and OBUs for light and Heavy Goods Vehicles (HGV). The solution for the French border crossing started with partial implementation in 2011, while the Portuguese trials just started in 2014.



**... the transactions using the Pilot interoperable OBU represented 0,26% of the operations, from a potential 31,62% of foreign HGV that cross this border daily according to the non financial transactions recorded by Abertis.**

Despite the development of successful technological solutions, and a clear bet on this technology, payments through OBU represent on average only 40%-50% of toll road payments in the Abertis network; and border transactions with interoperable OBUs are negligible. As an example of an alternative way to reach some level of “interoperability”, albeit at a regional level and aimed at HGV, there is the one developed by French and Spanish issuers, that stored a Via-T contract (ETC Spanish national scheme) and a TIS-PL contract (ETC French national scheme for HGV) into one single OBU. In the case of the French and Spanish border, the transactions using the Pilot interoperable OBU represented 0,26% of the operations, from a potential 31,62% of foreign HGV that cross this border daily according to the non financial transactions recorded by Abertis.

This example shows a number of barriers for the implementation of the EETS. For instance, lack of demand, and therefore of transactions volume, make EU wide interoperability unattractive for both providers and users.

The need to invest in technological solutions to process transactions with different OBUs, added to the costs of long and complex negotiations with different stakeholders is another clear barrier. Uncertainties and risks associated to the financial transactions have had to be assumed by the service provider without compensation. In conclusion, for a successful EETS a viable business case needs to be in place and supported by all stakeholders.

# EETS MODEL: PILLARS FOR A SUCCESSFUL IMPLEMENTATION

In this paper we will look at the EETS implementation from a holistic point of view. We believe a structured framework for EETS implementation needs to be in place for its success. This model is sustained by four pillars that need to be developed at the same time: operational, technological, financial requirements and regulations. For each pillar we will identify the current situation, point out the main problems to be solved, and propose potential solutions.



## 1. OPERATIONAL ASPECTS

The ETC has clear advantages in terms of efficiency, traffic flow and road safety; however, the costs associated to having a European wide service might not compensate for the benefits of a common system. Investments are relatively high, as interoperability requires changes in the charging systems already in place. Some of the costs are due to the complexity to reach bilateral agreements with all stakeholders, namely national Public Administrations, service providers, financial institutions and toll road operators. Moreover, in some countries there are exclusivity conditions between the Provider and the Toll Charger. In addition to that, changes in the system often have an effect in law and in concession agreements clauses.

The costs associated with the implementation of an interoperable system are another factor that has to be taken into consideration, as the economic volumes might not compensate users or providers for the development or acquisition of OBU with such payment facilities. This limited demand is true for Heavy Goods Vehicles (HGV), where the estimation of trucks crossing borders in the Member States amounts to 800.000 vehicles, but it is even more so for cars, which tend to limit themselves to crossing only one border if any, and not very often. The current situation, with different national systems, different prices, and different legal frameworks, makes the operational barriers and the limited number of users too costly to compensate for the full interoperability.

A harmonised system, based on a wider extension of the user pays and polluter pays principles, will help create the necessary price signals for an efficient and sustainable use of road infrastructure in Europe. The EETS would be a good complement to an EU-wide toll harmonisation, as it would minimise costs for users and enhance the

transparency of tariffs.

Extending the value proposition of the EETS to cover a larger network, while overcoming the concerns of the different stakeholders (see eCall lessons), would make its use more attractive, for both the supply and the demand sides. This harmonisation should be implemented with a differentiated transition period for those Member States with existing toll roads and for those with no toll roads.

Moreover, the expansion of toll systems in new countries should be done with interoperable solutions, learning from the experience in other EU countries and the know-how of toll chargers and service providers. The Commission could also facilitate and promote agreements among service providers to cover the whole EU without the need to reach an agreement with all toll chargers.



**The EETS would be a good complement to an EU-wide toll harmonisation, as it would minimise costs for users and enhance the transparency of tariffs.**





# eCALL LESSONS

(SOURCE: EC.EUROPA.EU)

In May 2015, the Regulation (EU) 2015/758 with the European Parliament and Council agreement approving the requirements for the deployment of the eCall and amending Directive 2007/46/EC set the mandatory fitting of 112-based in-vehicle system from 31 March 2018 onward. The eCall system, which incorporates a dormant SIM card, dials the 112, establishes a telephone link to the emergency call centre and sends the details of the accident, including the time of incident, the accurate position of the vehicle and the direction of travel. The eCall is activated automatically as soon as in-vehicle sensors/processors (e.g. airbag) detect a serious crash or manually by pushing a button in the car (e.g. by a witness).

Main lessons to be learned are: How the eCall has overcome the concerns on data protection issues thanks to a technological solution that guarantees that only minimum details of the accident are recorded and sent only in case of a serious accident. Moreover, by incorporating the system in all new cars, it has been achieved at a minimum cost (approx. 100€) relative to the total cost of the car.



## 2. TECHNOLOGICAL ASPECTS

There are three different tolling schemes in the EU:

- **Traditional Toll booths:** users can pay through OBU based on dedicated short-range communications (DSRC), credit card or cash.
- **Multi-Lane Free-Flow:** users can pay through an OBU based on dedicated short-range communications (DSRC) or through Automatic Number Plate Recognition (ANPR), known as video-tolling.
- **Global Navigation Satellite Systems (GNSS):** users can pay through an OBU based on GNSS+DSRC+ANPR (for enforcement) and equipped with mobile communications.

The two main technologies applied in Europe are the DSRC and GNSS, both requiring an OBU installed in the vehicle. DSRC and GNSS can work together, and both comply with European Directives, but the OBUs have to be adjusted at a cost, and still require enforcement infrastructure. There is an increased interest in combined GNSS and DSRC devices especially for HGV, as the OBU cost can be compensated through a more intensive use of the vehicle. The technical solution to be adopted should take into consideration the size of the network (number of kilometres to be tolled) and the number of vehicles. The latest analysis promoted by the Commission<sup>10</sup> shows the different advantages and disadvantages for current and potential technologies applied in Electronic Tolling.

Abertis agrees with the EU policy stance in favour of technology neutrality also in the implementation of the EETS. As seen above, there are many possibilities for developing an interoperable solution with the current systems in place in the Member States. Radio Frequency Identification (RFID) is another

tolling technology, which is a very popular solution in the US and winning popularity worldwide, and it relies on radio waves that read the tags located in the vehicle. The RFID technology generally has a very low cost of implementation, but it does not allow for high speeds when paying. Also video tolling is gaining popularity and allows for good free flow speeds, but it requires agreement among Member States for the handling of toll violations. Moreover, there are trends that point to the appearance of substitute technologies, such as Smartphones, V2V-V2I, autonomous driving, etc., that can prove easier to interoperate.

Currently, there does not seem to be a definitive technological solution that would have advantages above the rest. The solution to be adopted should be able to overcome the concerns of the different stakeholders and bring benefits in terms of safety, security, costs and reliability (see eCall lessons). The Commission should support innovation by facilitating funding, and should promote more coherent guidelines for suppliers to follow. The Commission could also amend the EETS Directive to allow the use of additional tolling technologies.



**The technological solution to be adopted should be able to overcome the concerns of the different stakeholders and bring benefits in terms of safety, security, costs and reliability.**

### 3. FINANCIAL ASPECTS

In the implementation of an electronic payment system across EU borders, there is currently an important level of financial risks, because there is no guarantee of payment, no certification procedures and no guarantee of payment, no certification procedures and no back office systems for all the 28 Member States. The risk of nonpayment represents one of the main problems in transnational transactions, especially when the cost recovery through higher transactions volumes is not warranted.

According to Decision 2009/750/EC, in order to become an EETS provider it is mandatory to reach an agreement with all European toll chargers and deposit a guaranty for each national tolling scheme. These guaranties could represent an important amount of money. Moreover, it is also difficult and costly to have offices in all Member States for commercial and billing purposes alone, having to deal with all labour and language complexities for companies that tend to have a national focus.

There are many examples where the financial sector has facilitated the interoperability of OBU from different providers/toll chargers within a country. At the national level there is the spanish case where the OBU is mostly commercialised, as a credit card product, by financial institutions that bear the default risk through a clearing house, using a scheme replicated from the credit card system. In other cases, regional agreements or joint ventures have been developed, such as the one promoted by Bip&Drive and Bip&Go, where the Service providers guarantee the payment in foreign countries, sharing the risk of default.

The Commission should ease private investment in this industry by reducing the current complexities. There should be clear certification rules and procedures for the

EETS, with the intervention of a third party to ensure the uniform application of standards. Moreover, financial risks could be reduced with the promotion of a clearing house for EETS with the participation of toll chargers associations, financial operators, credit institutions and payment service providers (see SEPA lessons). The Commission could reduce the financial risk with the promotion of an EU wide framework for developing a clearing house for ETC.



**The risk of non-payment represents one of the main problems in transnational transactions, especially when the cost recovery through higher transactions volumes is not warranted.**

## 4. REGULATORY ASPECTS

The Commission adopted Directive 2004/52/EC to create an EETS that would enable road users to pay tolls and charges throughout the EU with a single EETS Service Provider and a single on-board unit. However, it had been impossible to achieve the objectives; later in 2009 the Commission, through Decision 2009/750/EC, set the general requirements necessary for an EETS available for HGV starting October 2012 and for all other types of vehicles by October 2014. In the announced Road Transport package for 2016, it was stated the need for a “Fair and efficient pricing for sustainable transport – revision of the Eurovignette Directive and framework to promote European electronic tolling”.

Currently, the absence of a system for EU enforcement of toll payments is one of the main barriers to ease toll payments throughout the EU. Already in Spain traffic authorities have established a procedure that applies automatically to national evaders through changes in the regulation<sup>11</sup> of traffic offenses and the rights and obligations of highways’ concessions that was implemented in 2013. However, this change is difficult to apply to other EU citizens, because there is not a clear way to enforce the payment obligation to foreign registered cars, since toll payment violation is not considered a traffic offense in the whole EU. This makes non-payment in cross border transactions much more difficult to enforce, increasing the financial risks for the development of an EETS and the implementation of free flow technologies. It is also a limiting factor for EU-wide mobility policies, because it requires the construction of barriers or enforcement controls in countries where the toll operator has the responsibility to enforce payment. For these reasons, it is a limiting factor to the application of the user-pays and polluter-pays principles.

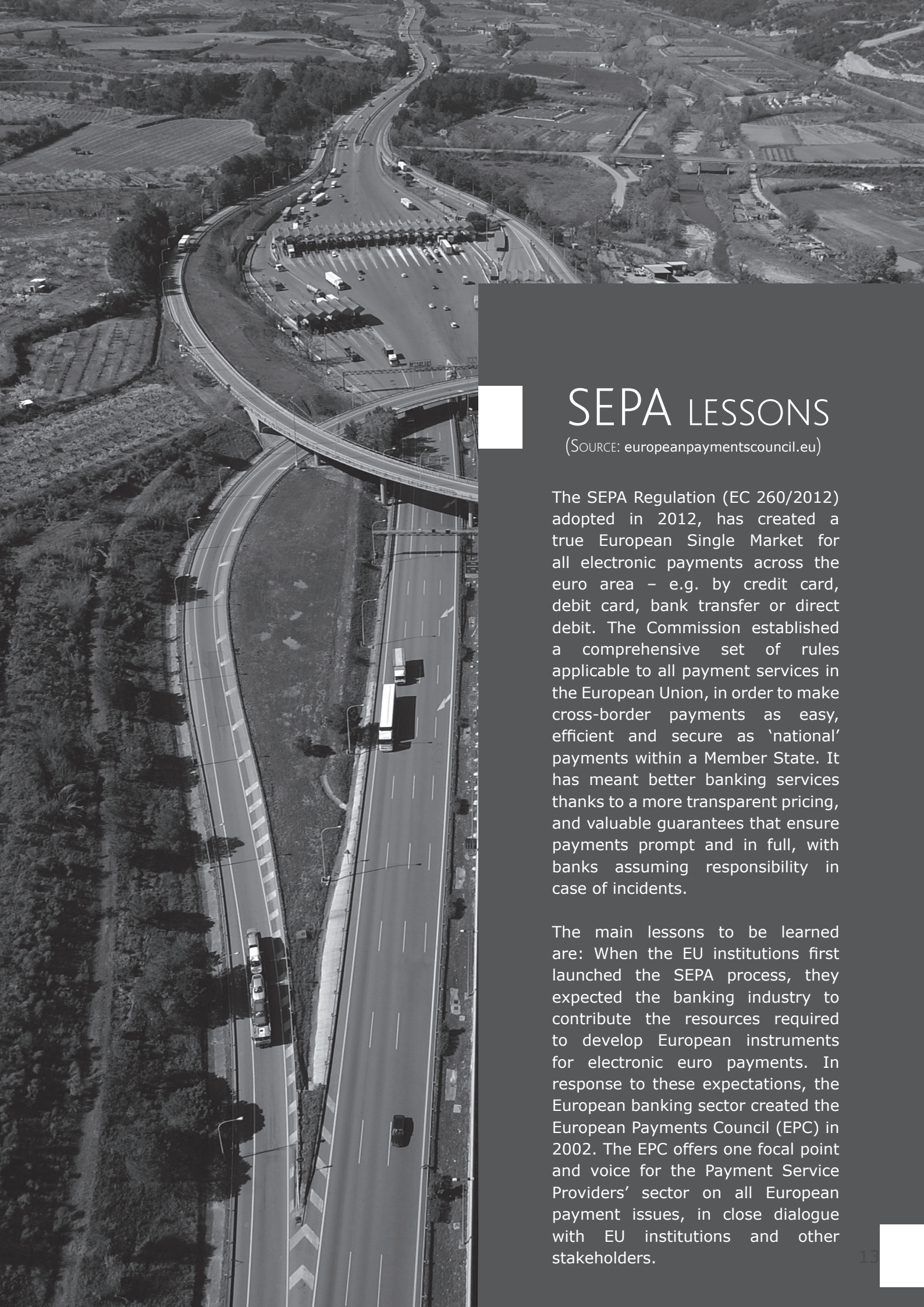
EETS implementation requires reliable enforcement mechanisms to identify toll evaders and guarantee the payment of electronic tolls within the EU. The EU Cross Border Enforcement Directive (see EU Enforcement lessons), adopted in March 2015, is a good example of enforcement for major traffic offenses. However, these offenses do not include toll road payment. This is a missed opportunity for the implementation of a road user charging system. The assessment of the Cross-border Directive in November 2016, should also promote a revision of the list with the traffic offences, and it could be a good occasion to include the toll payment obligation.

The stance of this paper is that regulators promote sharing of data on car registration and evasion of payments through a secure pan-European database, which could be established through measures similar to the ones provided for in the Cross Border Enforcement Directive.



**EETS implementation requires reliable enforcement mechanisms to identify toll evaders and guarantee the payment of electronic tolls within the EU.**





# SEPA LESSONS

(SOURCE: [europeanpaymentscouncil.eu](http://europeanpaymentscouncil.eu))

The SEPA Regulation (EC 260/2012) adopted in 2012, has created a true European Single Market for all electronic payments across the euro area – e.g. by credit card, debit card, bank transfer or direct debit. The Commission established a comprehensive set of rules applicable to all payment services in the European Union, in order to make cross-border payments as easy, efficient and secure as ‘national’ payments within a Member State. It has meant better banking services thanks to a more transparent pricing, and valuable guarantees that ensure payments prompt and in full, with banks assuming responsibility in case of incidents.

The main lessons to be learned are: When the EU institutions first launched the SEPA process, they expected the banking industry to contribute the resources required to develop European instruments for electronic euro payments. In response to these expectations, the European banking sector created the European Payments Council (EPC) in 2002. The EPC offers one focal point and voice for the Payment Service Providers’ sector on all European payment issues, in close dialogue with EU institutions and other stakeholders.

# RECOMMENDATIONS

1. Extension of the pay-per-use for the high capacity road network (see Abertis Position Paper on Road User Charging).
2. Creation of the conditions for a holistic model with clear risk/benefit distribution and implemented across all Member States.
  - 2.1. In the path for an EU-wide Road charging system, there should be a differentiated transition period for those Member States with existing toll roads, and for those with no toll roads.
  - 2.2. Promote coherent guidelines and research to implement an interoperable technology EU-wide, building on successful examples at hand, such as eCall.
  - 2.3. Promote a clearing house system at EU level or coordinated at national level for ETC payments, inspired by the SEPA example.
  - 2.4. Implement reliable enforcement mechanisms to identify toll evaders and guarantee the payment of electronic tolls within the EU.
3. The establishment of a high level expert group at EU level, assembling all stakeholders of EETS, EU Commission, Member States, Toll Road Operators, Service Providers, Notified Bodies, Financial Institutions and representatives of the users, could prove a valuable tool to address the four pillars necessary to advance on EETS deployment.

## EU ENFORCEMENT LESSONS

(SOURCE: ETSC.EU)

Cross Border Enforcement refers to the pursuit of traffic offences committed by drivers of a car which is registered in an EU Member State different than the one where they were detected. The goal of the Directive is to offer an automated tool for enforcement authorities in the Member State where the offence was committed to pursue and fine the drivers of cars registered in other EU Member States when they commit traffic offences.

Co-operation agreements existed in the form of bi-lateral and multi-lateral agreements and many EU Member States already had systems in place to follow up traffic fines. However they were often not able to deal with the increasingly complex cross-border problems posed by traffic offenders. The Directive presents an EU wide automated approach.

This Directive meant that EU Member States will not have to negotiate new bilateral agreements with other countries.

Main lessons to be learned: According to the Commission analysis<sup>12</sup>, a foreign registered car is three times more likely to commit traffic offences than a domestically-registered one. The Commission expected the highest positive benefits to be observed in countries with high levels of transit and tourism traffic, such as Austria, Belgium, France, Germany, Hungary, Italy, Luxembourg, Poland or Spain. This same logic could also be applied to toll payment violations, bringing benefits to the application of the user-pays and polluter-pays principles promoted by the Commission.



# CONCLUSIONS

Abertis supports the efforts of the Commission in fostering harmonisation in road charging systems throughout the EU. We share Commissioner Bulc's approach towards combining the complete interoperability of tolling systems with an effective implementation of the user pays, polluter pays principles and in this context we stand ready to work towards a balanced and sound revision of the EETS Directive, as expressed in the analysis and conclusions of the "Evaluation and Fitness Check Roadmap on the EETS"<sup>13</sup> of September 2015.

Abertis advocates for a compulsory EU harmonised modular toll system, based on distance travelled and applied to all vehicles, which would prove the best way to achieve various needed objectives: a real single European transport space, the internalization of all road transport costs, and the liberation of scarce public resources for different social needs. Once an EU-wide harmonised toll

system is in place, it would be more cost effective to have an interoperable system. The extension of road charging to all EU network could compensate for the associated financial costs; to avoid financial risks, a common "clearing house" should be promoted, building on the association of toll chargers, service providers and financial institutions (see SEPA lessons). The system could be based in a technology that identifies vehicles, using a European standard (see eCall lessons), taking into account stakeholders concerns on privacy issues, the costs of equipments, functionalities, etc. Stronger enforcement mechanisms should be put in place for the system to work and facilitate the application of user-pays and polluter-pays principles. Finally, it would be advisable to establish a transition period with mechanisms that guarantee the success of such implementation, taking into account each Member State legal and toll road system.

# REFERENCES

1. CESARE: Common Electronic Fee Collection System for a Road Tolling European Service
2. PISTA: Pilot on Interoperable Systems for Tolling Applications, Pilot Project (5th RTD Framework Programme)
3. RCI: Road Charging Interoperability, Pilot Project (6th RTD Framework Programme)
4. REETS: Regional European Electronic Toll Service, Pilot Project (7th Framework Programme)
5. COM/2015/80: The Commission announcement of its Strategy for a Resilient Energy Union
6. "Eurovignette Directive": <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV%3A124045b>
7. "EETS Directive": <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1450168757895&uri=CELEX:32004L0052>
8. "Cross Border Enforcement Directive": <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32015L0413>
9. "Decision 2009/750/EC": <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32009D0750>
10. DGMOVE Study on the "State of the Art of Electronic Road Tolling": [http://ec.europa.eu/transport/modes/road/road\\_charging/doc/study-electronic-road-tolling.pdf](http://ec.europa.eu/transport/modes/road/road_charging/doc/study-electronic-road-tolling.pdf)
11. Law 17/2012, december 27, 2012, with amendments to the Law 8/1972 in articles 14 and 29 that articulate Highways in concession regime, and ammendements in Article 18 of the Royal Decree 339/1990 of 2 March, that articulates the Law on Motor Vehicle Traffic and Road Safety. Both changes with effect from January 1, 2013
12. Commission analysis on foreign-registered car traffic offences [http://europa.eu/rapid/press-release\\_MEMO-11-483\\_en.htm](http://europa.eu/rapid/press-release_MEMO-11-483_en.htm)
13. DGMOVE Analysis on the "Evaluation and Fitness Check Roadmap on the EETS": Evaluation of the legislation on the European Electronic Toll Service (EETS) – Directive 2004/52/EC and Decision 2009/750/EC