Interoperable EFC and Road Pricing in Europe

Directive 2004/52

European Commission - DG TREN
1. TOWARDS INTEROPERABILITY
1. THE STATUS OF THE DIRECTIVE

- Adopted in March 2004 by the Council and in April 2004 by the Parliament
- In force since end of May 2004
EFC Directive

2. THE OBJECTIVE:

- Regulatory frame for the deployment of a unique **European EFC service** in three stages:
  - **First stage**: definition of the service for 1 July 2006
  - **Second stage**: HGV and Long Distance Coaches, 3 years after - planned for mid 2009
  - **Third stage**: all vehicles, 2 years after trucks - planned for mid 2011
- The Directive will not interfere with the pricing policies of the Member States, but the systems implemented should be capable to handle any charging policy decided at national levels
3. THE PRINCIPLES OF THE SERVICE

- take the point of view of the client
- offering the service will be mandatory for operators
- subscribing to the service will be voluntarily for the clients
- Based on interoperable systems
- Systems with no onboard unit or of very local interest excluded from the obligation (ex: London Charging)
EFC Directive

- **basic principle**: one single contract - one single onboard unit per vehicle
- Later on: one single invoice? – but not mentioned in the text
- available on the whole tolled network
- used for whatever toll or fee or tax
- same quality of service in any country, non depending on the country where the contract is signed, the nationality of the vehicle or the driver
One single contract?

- This contract is a service contract for the use of a means of payment.
- Like the contract with VISA or MASTERCARD for the use of their credit card.
- This is not a contract related to the obligation of payment of a fee or to the services linked to the payment of a toll.
4. **THE TECHNOLOGIES:**

Two basic technologies:
- GNSS / GPRS as a future objective for all systems
- Microwave 5.8 GHz

Plus
- A link to the digital tachygraph
- Other technologies allowed as far as they do not discriminate non-equipped clients
Strong recommendation in favor of satellite based tolling system

- Why?
  - The only solution to cope with the political requirements of the European Commission and of Member States
  - Allows to go from motorway tolling to area pricing or a general charge on the whole road network
  - When microwave technologies become obsolete, a common technology needs to be elected to ensure interoperability
  - OBU used for tolling should also facilitate the deployment of ITS services like monitoring of dangerous goods, automatic emergency handling...
GALILEO for toll collection

How to compute a charge proportional to the kms driven with no complicated equipment?

GALILEO

allows to know on time where the vehicle is with an accuracy better than 5 meters, 95% of the time
This is the basis of the GNSS / CN solution, first to be implemented in Germany, later in some other countries:

- will start with GSP
- then commutes to GALILEO
- mobile communications used to download payment data to the central billing system
- enforcement thru DSRC or IR
GALILEO for toll collection

The advantages:

- no need for large infrastructures
- no need for expensive roadside equipment
- fits to all kind of zone: urban, motorway, countryside
- onboard equipment can be used for other services
GALILEO for ITS

- GALILEO can facilitate the development of other ITS services for the vehicle of tomorrow:
  - automatic emergency calls with location: possibility to know also the direction of the vehicle
  - road safety and ADAS systems
  - freight and fleet management
  - traffic surveillance
  - route guidance
EGNOS is the first step to Galileo and part of the European Satellite Navigation Strategy. It will become operational in late 2004 and is partially funded by air traffic services providers.

EGNOS will pave the way and reduce the risks for GALILEO in different domains:

- Technical aspects (i.e. integrity).
- Operational experience.
- Certification process.
- Institutional framework.....
EGNOS (European Geostationary Navigation Overlay Service)

EGNOS makes US military-based GPS usable for safety-critical civil applications

EGNOS provides Integrity signal through independent Ground Control Segment

EGNOS is being implemented in parallel with US WAAS and Japan MSAS
GNSS-1 Interoperability
WAAS (US) & EGNOS & MSAS (Japan): first step towards service guarantees

EGNOS:
♦ Complement to GPS and GLONASS with 2 Inmarsat / 1 Artemis Transponders
♦ First step towards GALILEO
♦ Interoperable with WAAS and MSAS

GPS-type (Ranging) Signal
Correction signals
Integrity

higher availability
meter accuracy
service guarantee
EGNOS

- Might facilitate the deployment of satellite based EFC systems improving the satellite coverage and the accuracy of the vehicle location.

- An important asset for the migration to a complete coverage of European road network with satellite based ITS systems.

- Will be used for tests in ESA and Galileo FP6 projects like **ARMAS** and **VERT**
Migration to satellite based charging schemes:

- More and more National charging policies, not necessarily limited to motorways: CH, DE, UK, CZ, SK, SLO...
- Satellite based EFC is part of the future of European roads
- First experience in Germany
- Deployment facilitated by research and tests with demonstration projects ARMAS, VERT, RCI (see below part 3)
EFC Directive

- Satellite based EFC means new actors in the field (telecom operators) and new solutions for specific problems (enforcement is no more physical):
  - Expert Groups launched by EC
  - And participation of Germany in CESARE III (see below part 3) working on contractual issues
- Standardization activities prepared with EC support ready for the end of 2004
- Every element of definition should be ready for June 2006
EFC Directive

- **How to do it in the vehicle?**
  - A pragmatic approach is needed which could lead to different interoperable versions of onboard units
  - It is the role of the industry and of the operators to define the landscape according to its business case

- **How to do it on the ground?**
  - Toll operators will continue to choose the EFC frame they wish, in accordance with their policy and the structure of their network
  - The same OBU will address the different transactions
2. COMITE TELEPEAGE AND ROAD PLATFORM
It is a **Regulatory Committee**

Can be invited also as an **Expert Group** to prepare the documents and resolutions proposed for vote in the **Regulatory Committee**
COMITE TELEPEAGE

- **Regulatory Committee** limited to the 25 EU Member States

The COMITE TELEPEAGE is a group representing the Member States and some associated countries.

There is a need for a link with the private sector.

There is a need for a concrete implementation of the decisions of the COMITE and a feedback to it on first experiences.
The link with the private sector is the ROAD PLATFORM launched by the road operators association ASECAP and supported by the EC DG TREN

- Already 6 meetings
- Each of them on a specific topic
- Registration free at asecap@skynet.be
ROAD PLATFORM

- Open platform
- Informal structure
- Gathers road operators, service operators, car manufacturers, equipment providers and the EC
- Aims to discuss specific ITS issues and eventually launch joint actions
- Managed by ASECAP and EC jointly
3. WORK PROGRAM
UNTIL 2006
Work Program

1. precise and concrete definition of the European EFC Service, based on user requirements (IRU and others)

- One contract, rights and duties
- Link to a bank account
- Price of the service: in principle yes or no?
- One onboard unit
- Installation of the OBU
- Lanes equipped
- Signalization on lanes
Work Program

• Conditions for use on toll points
• Enforcement rules
• After-sales service
• Procedures in case of misfunction
• Checking of the data contained in the memory
• invoicing
• Means of payment
• ...

How to do it ? :

• Project Cesare III
Work Program

2. **technologies** supporting the EFC service and their evolution
   - GNSS / CN
   - CEN DSRC
   - Telepass

In the future :
   - UMTS
   - Galileo vs GPS

Other technologies (infrared...)

Commission Européenne
Direction Générale de l’Énergie et des Transports
Work Program

How to do this job?

- Use widely the *Road Platform* for concertation with the industry
- *Working groups* to study proposals to the Comité on these issues
- *FP6 project RCIPP* for demonstration
WORKING GROUPS

- Call launched for CVs of experts
- Open until 30 June 2006
- CVs put in a database where people are chosen to build a task force
- Task forces contracted by EC for limited number of days and very detailed working scope
- Report presented to the COMITE TELEPEAGE
Work Program

- Working Groups already launched:
  - 1. DSRC technologies led by Jesper Engdahl (RAPP AG)
  - 2. Classification of vehicles led by Ken Perrett
  - 3. enforcement of offenses led by Jean Mesqui (ASFA)
  - 4. certification centers (to be defined)
  - 5. GNSS/CN technologies for EFC led by Wolfgang Beier (Toll Collect)
  - 6. integration of OBU in vehicles to be defined
  - ...

Commission Européenne
Direction Générale de l’Énergie et des Transports
Work Program

- **RCI**
  - Project for demonstration under the frame of the 6th RTD FP
  - Launched in late 2004 for 36 months
  - Led by ERTICO and involves most of motorway and toll operators in Europe
  - Demonstration of transactions by DSRC as well as GNSS / CN with the same onboard unit
  - Call for tenders to choose an electronic integrator for the OBU
3. **Procedural interoperability**

between operators:

- **basic principle**: equal treatment between natives and foreigners
- Logo
- Transaction process on the spot in toll plazas and on area tolling
- Forms to be used by the client
- Problem of languages
Work Program

- Procedures for control of the client (anti-fraud control)
- Clearing system
- Data transmitted between operators (transaction files, black lists...)
- Security of the transactions
- Ownership of the data by the operators, and accessibility of these, in comparison with privacy rights
Work Program

- **How to do it?**
  - Cesare III
CESARE III

- Follow-up of CESARE I and II
- Cesare II has provided important results for cooperation between road concessionnaires levying tolls
- Results applied in PISTA inside ES and between ES and FR
- CESARE III aims to adapt CESARE II to the needs of the Stockholm group organizations
Structure of the project:

- **WP 1 and 2**: revise business model and provide service definition
- **WP 3 and 4**: organisational arrangements and documents for contractual interoperability between operators of all kinds
- **WP 5**: procedural interoperability
- **WP 6**: liaison with external bodies like the Comité Télépéage
- **Duration 18 months**
4. **Integration** of the equipment in the vehicles

- Old vehicles to be equipped
- New vehicles: integration in the vehicle design

**How to do it?**

- Discussions with road platform
- Working group 6
- Links with other research activities and certification procedures (point 6)
5. Pan-European Certification procedures and label for equipment, including those for enforcement of violations

- Onboard units (key issue)
- Enforcement tools providing the evidence of the offence
- Integration of OBU in the vehicles

Need a network of certification centers and common procedures

How to do it?

- project to launch by DG TREN under a call for tenders in 2005
6. **Exception handling**

- VERA 2 leads to:
  - new EC draft Directive
  - Because no MS has started to implement the Council Decision of 8/5/03
  - eNFORCE network
  - Certification procedures for the equipment

- But VERA 2 might be more efficient for criminal offences than for civil ones like EFC

- Therefore, MS should do their best to fight fraud on their own territory

- Follow-up with expert group 3
Work Program

7. **Memorandum of Understanding** and exchange of data between all contract issuers (operators, financial institutions...)
   - Includes also the contract with the client, and the agreement between issuers and operators

**How to do it?**
- **Cesare III**
- **Legal issues studied with the cabinet Landwell from September 2004**
Thanks for your attention