



Asociación Argentina
de Carreteras



November 6th - 8th, 2013 Hotel Panamericano – City of Buenos Aires, Argentina
“URBAN MOBILITY, ROADS NETWORK OPERATION AND ITS APPLICATIONS”

Toll system interoperability: focus on the European experience

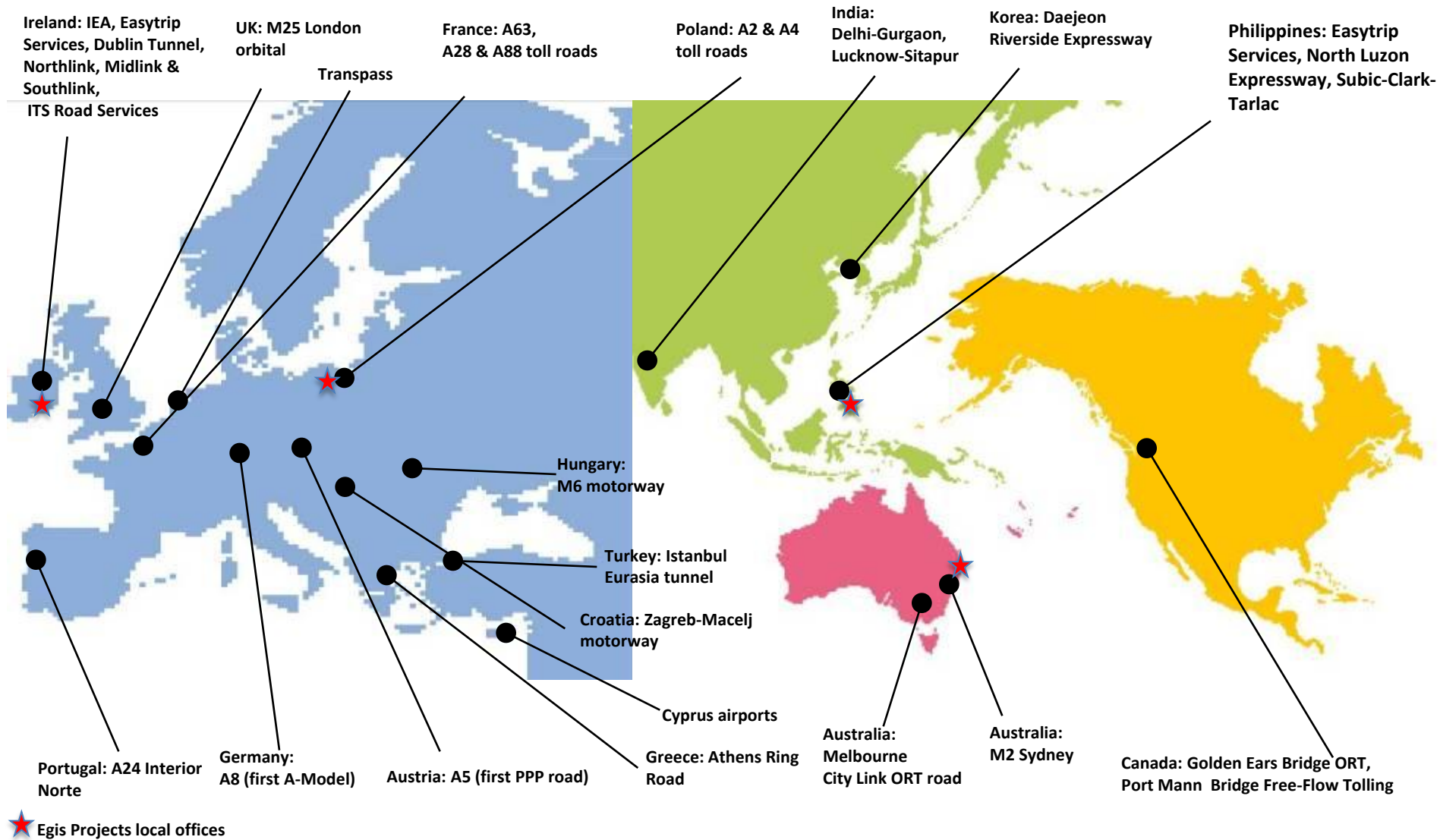
Emmanuelle Frénéat,
Egis Road Operation, France



Egis, a global approach to infrastructure development

- **Engineering**
 - Project Management
 - Engineering Procurement
 - Construction Project Management
 - Works Supervision
- **Consulting & Design**
 - Assistance to Owner
 - Project Management Consulting, Programming
 - Architecture, Urban Planning & Landscaping
 - Expertise, Audits, Certifications
- **Project Development & Turnkey Solutions**
 - PPP project structuring & investment
 - Turnkey delivery of ITS/Tolling systems
- **Operation & Road Mobility Services**
 - Road operation & maintenance
 - Airport Operation
 - Electronic road charging solutions
 - Road mobility services

Egis operating companies



06/11/13

Toll system interoperability: different approaches

The European context

- EC Directive 2004/52/EC on interoperable road toll systems across Europe including the EETS (European Electronic Toll Service)
- 2009: EETS decision: all member states to offer interoperability
 - For HGVs: by October 2012
 - For light vehicles: 2014
- 2013: Mostly intra-national interoperability

The “One approach”

- “One account – One bill – One OBU”
- Prerequisites
 - Technical interoperability (systems)
 - Functional interoperability (procedures)
 - Commercial interoperability (contracts between players)



Technical features

- **Varied technologies**
 - Varied protocols
 - Hybrid OBUs (satellite & mobile, DSCR & satellite)
- **Communications & interfaces**
 - DSRC OBU ↔ Roadside equipment
 - Satellite-based OBU ↔ Computing center

Protocols adopted in ETC schemes in Europe

	Light vehicles	Trucks
Satellite positioning	Not used	X
5,8 GHz microwave (DSRC tags)	X	X
Mobile communications GSM/GPRS	Not used	X
<i>Video tolling</i>	<i>n/a</i>	<i>n/a</i>
<i>NFC / RFID</i>	<i>n/a</i>	<i>n/a</i>

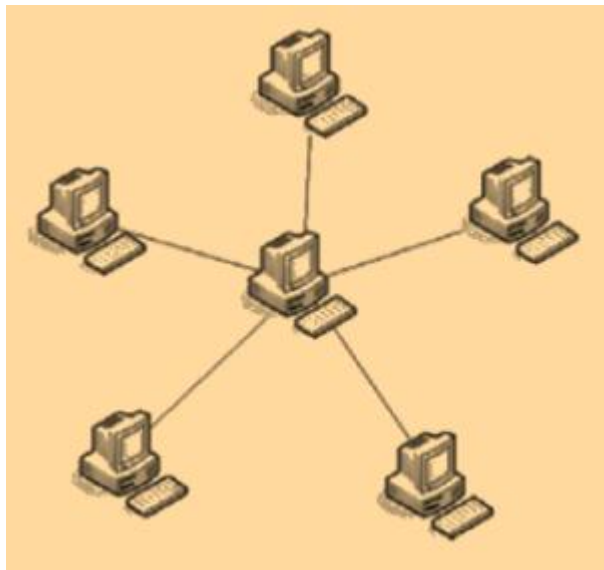
Procedures

- **Considering varied operational contexts**
 - ETC lanes / Non stop lanes / Multilane free-flow
 - Vehicle classification, Euro-class
 - Control and enforcement methods
 - Prepaid / postpaid commercial schemes
- **Organization of data exchanges**
 - Between toll operators
 - Between toll chargers and ETC tag issuers

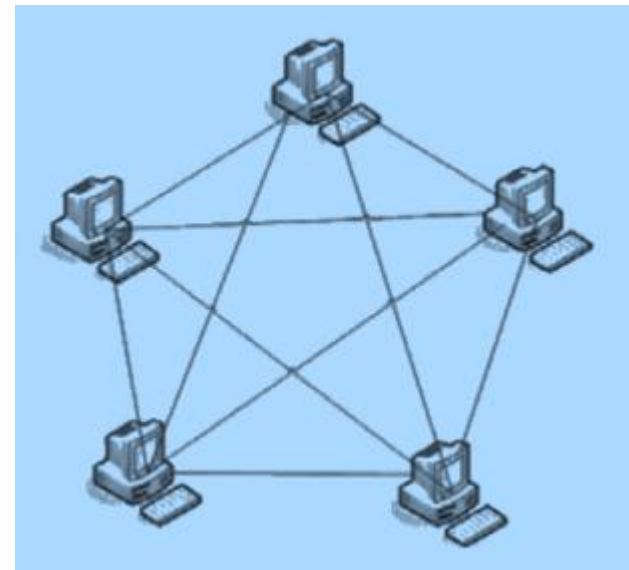
Different approaches for data exchanges

Hub Network

(Centrally managed solutions)



Peer-to-Peer Network



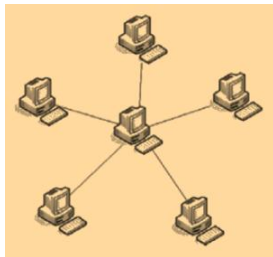
Commercial agreements

- **Set of business rules to be established**
 - By a central regulating authority (eg. Ireland)
 - Or as agreement between toll players (eg. toll chargers in France & Greece)
- **Commercial agreements include**
 - Performance levels to be achieved
 - Level of fees (eg. percentage on gross revenue)
 - Liabilities in respect of toll amounts payments

Case studies

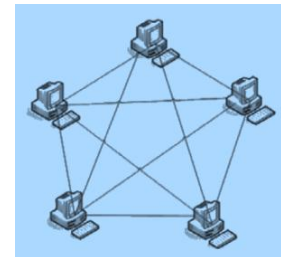
- Hub Network

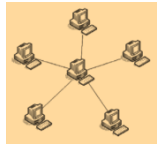
- Ireland: central clearing-house (Information Exchange Agent IEA)
- Greece: distributed interoperability (GRITS)



- Peer-to-Peer Network

- France (meshed concession companies network): TIS

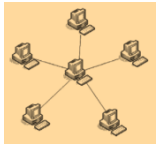




Ireland (IEA)

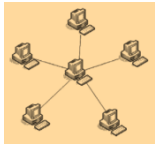
- Centralized clearing-house system
- Provided by the National Road Authority to toll road operators
- Multiple parties agreement
 - National Road Authority, IEA, all Irish Compatible Operators, independent tag service providers
- Contractual obligations set in concession contracts



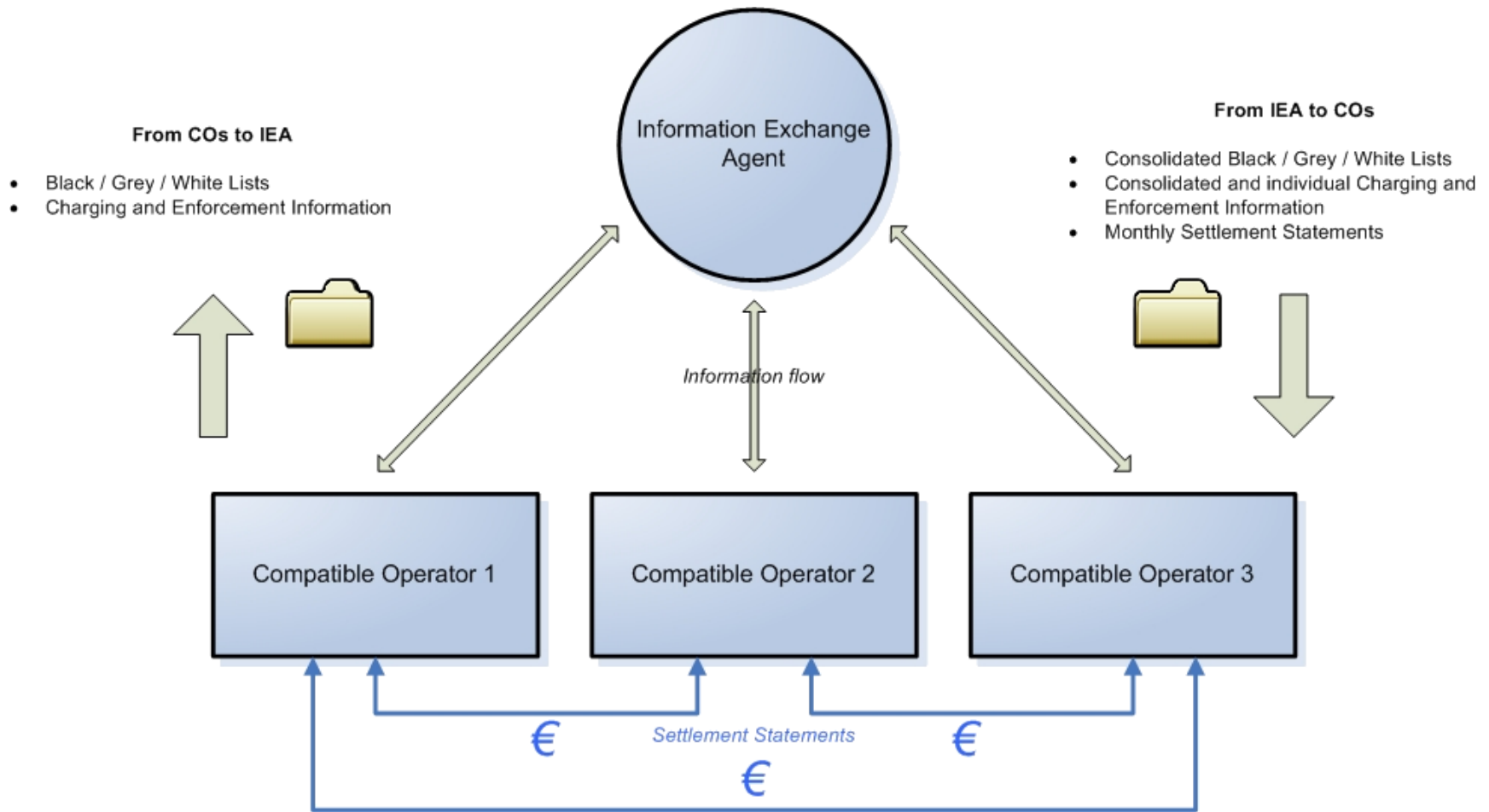


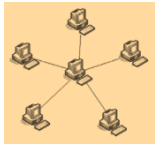
Ireland (IEA)

- Centralized clearing-house system
- IEA Service Agreement (outsourced System Supply and Operations through a single Service Contract)
 - Exchange & processing of interoperable data (ETC tag and charging information) as a unique agent
 - Revenue settlement statements between operators
 - Provision of a one-stop helpdesk to operators



Irish IEA - Functional aspects



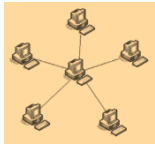


Greece (GRITS)

- Private initiative
(5 concession companies)
- Light vehicles
- Takes into account the prepaid Greek scheme
 - 99% of accounts are prepaid
 - Require real time information exchanges
- Based on a middle-tier
 - A generic data exchange tier, capable of interfacing modern applications with real time back office systems

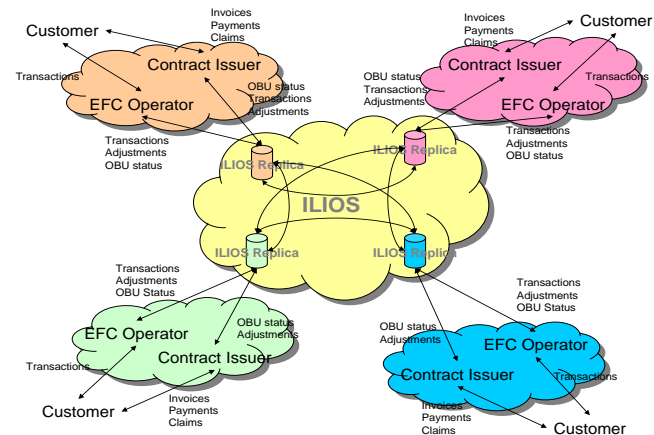


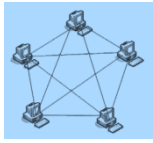
Greece (GRITS)



- Centrally managed interoperability & Clearing
 - Manages interoperable data exchange between operators
 - Integration of agencies part of the scheme
 - Reports and statements for revenue settlement between agencies
 - Provision of helpdesk to agencies

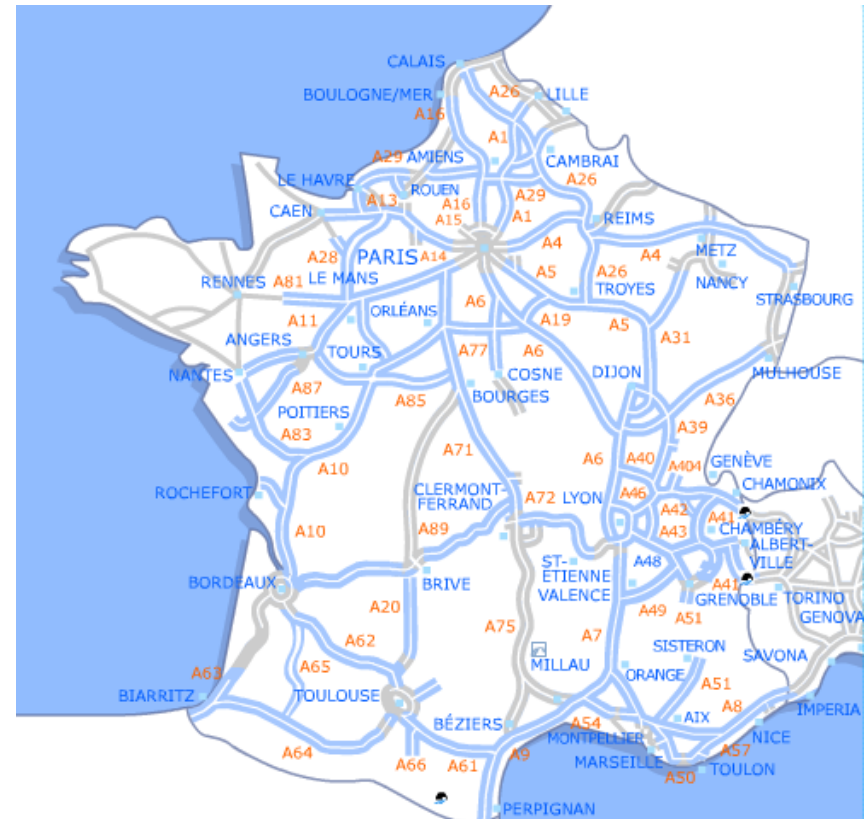
- The middle-tier
 - Open Architecture with distributed database (every participant creates its own interface)
 - Data transfer in near real time

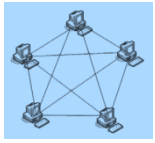




France (TIS)

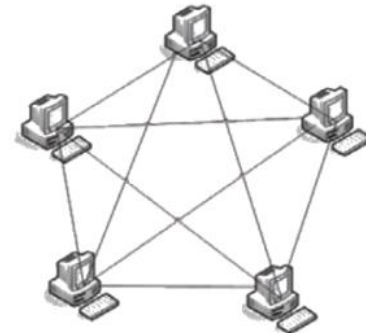
- 7 000 km interoperable
- 18 players (toll chargers)
- Light vehicles & HGVs
- Interoperability standards (CIP)
 - designed & maintained by concessionaires
 - in an associative manner





France (TIS)

- **One-to-one approach**
 - Each Operator is responsible for system interfaces setup and data exchange with all other operators
 - Reports and statements for revenue settlement by each operator
 - Helpdesk to all other operators
- **All systems are inter connected**
 - $N!/2(N-2)!$ Physical links between operators
 - For 10 operators, 45 links to be set up



Conclusions

- Technologies should not act as a brake
- Centralized clearing house model has proven effectiveness
- Key success factors
 - Interoperability platform shall enable the timely exchange of information
 - Simple architectures → cost-efficient operations & seamless integration of new players



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Thank you for your attention

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the European experience

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