Kapsch TrafficCom.

Financing road transport infrastructure.

Working Party on Transport Trends and Economics (WP.5), Geneva, 8th September 2014, Palais de Nations

Gilbert Konzett

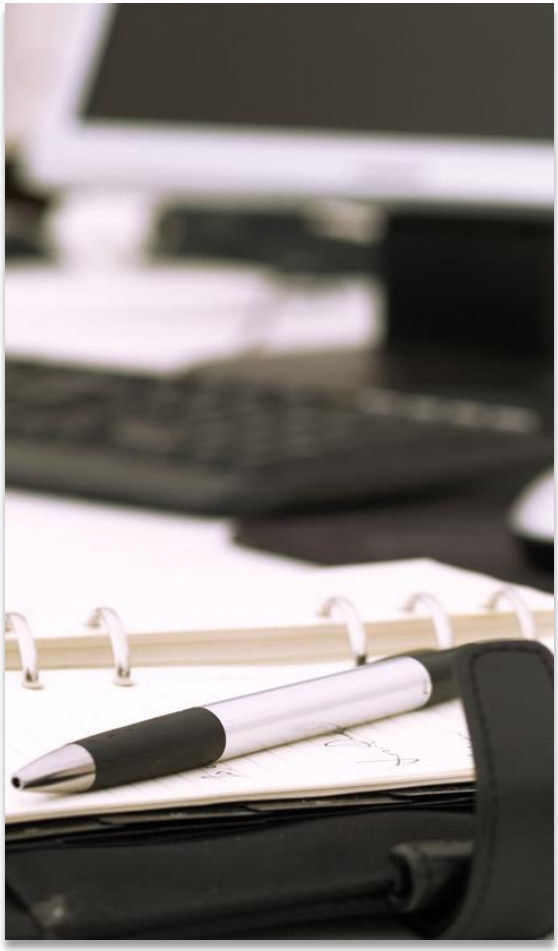
Agenda

1. Kapsch TrafficCom at a glance

2. The evolution of Road User Charging in Europe

3. From the business case to the solution

4. Conclusions, Sum-up Key aspects



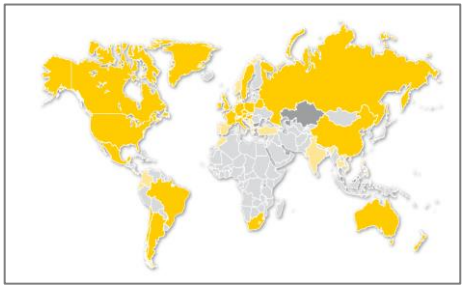
The **future** has always been part of our family.

Kapsch TrafficCom (KTC) at a glance.

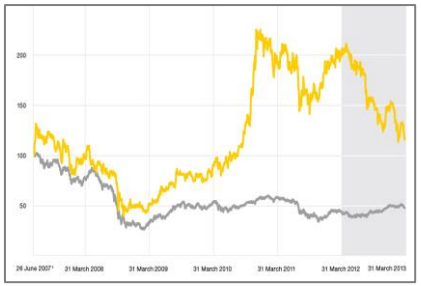
- KTC is a provider of Intelligent Transportation Systems (ITS).
- Headquartered in Vienna, Austria – founded in 1991.
- Presence in 33 countries on all continents.
- EUR 487 million of revenues with more than 3,300 employees.

Core business in Electronic Toll Collection (ETC).

End-to-End Solutions as a One-stop Shop.



References in 44 countries on all continents.



Listed since 2007 with free float at 38.1%.

Kapsch TrafficCom Business Model.

Components

In-vehicle Products

On-board Units (OBUs)

Transceivers & Readers

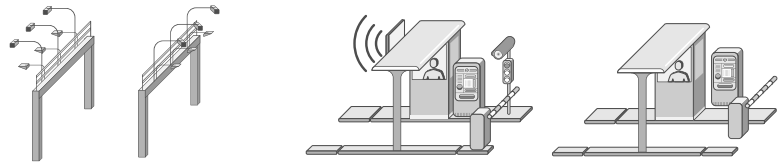
Cameras & Sensors

Design & Build

System Integration Activities

- Design, customization
- Rollout, documentation
- Acceptance testing
- Project management
- Subcontractor management
- Training

Road User Charging Systems



Multi-Lane Free-Flow ETC | Single Lane ETC | Plaza Solution

Nationwide | Regional | Road Sections | Bridges | Tunnels

End-to-End Solutions as a One-stop Shop.

Operations

Technical Operations

- Maintenance
- System optimization
- Monitoring
- Statistics, reports & Documentation

Commercial Operations

- Point-of-sale systems
- Call centers
- Web portals
- Payment services
- Manual validation

Mobile Enforcement

Mobile Enforcement Vehicle

Major References.

Czech Republic

Nationwide ETC system for trucks on now 1,350 km (2007) and traffic management system (2011).

Poland

Nationwide ETC system for trucks on now 2,600 km (2011).

Austria

Traffic management system (1995) and nationwide ETC system for trucks on now 2,200 km (2004).

Belarus

Nationwide ETC system on now 933 km (2013).

Switzerland

Nationwide infrastructure and enforcement system for heavy goods vehicle system “LSVA” (1999).

Sweden/Denmark

Single-lane ETC system on Oresund and Storebaelt bridges connecting Sweden with Denmark (1998/2000).

Italy

Urban access solutions in various cities.

Russia

Urban access solutions in city of Kasan (2011) and weigh-in-motion stations on highway (2013).

U.S.A.

E-ZPass system, truck preclearance system “PrePass“ and North Tarrant Express in Texas (2013).

Canada

ETC system on highway 407 ETR.

Chile

Three ETC systems for all vehicles on motorways and expressways (2004-2006).

South Africa

ETC system for all vehicles on Platinum Highway (2002) and on 185 km in Gauteng province (2013).

Australia

ETC systems for all vehicles in Melbourne (1999), Sydney (2006) and Brisbane (2007).

New Zealand

ETC system for all vehicles on a road section (2007).

India

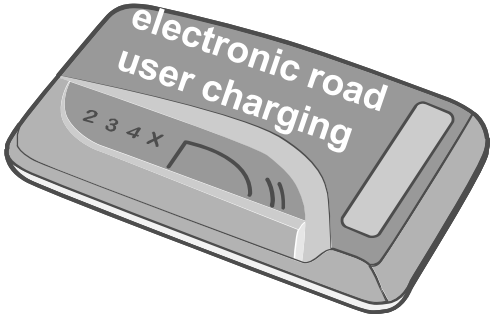
Manual toll collection system on Highway number 8 in New Delhi (2008).

Thailand

ETC systems for the three largest city highways in Bangkok (2008).

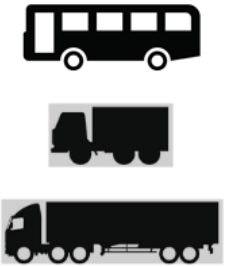
The evolution of HGV charging systems in Europe.

The evolution of HGV charging systems.

No direct user charge	Time-based charging (Vignette)	Distance-based charging (Péage)
No direct user charge	 **HGV Vignette (paper/electronic)**	
▪ financed by taxes ▪ unfair: high-mileage users treated like low mileage users ▪ distortion: no link between consumption and price ▪ perverse incentive: rewards excessive use	• user pays for time on infrastructure • unfair: high-mileage users treated like low mileage users • manual enforcement (expensive) • high level of fraud	• user pays for distance driven • fair: users pay for distance driven • automatic enforcement • flexible: traffic management possible/combines with ITS

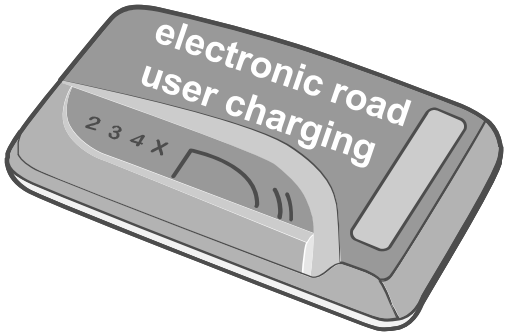
The evolution of HGV charging systems.

No direct user charge



time-based charging

distance-based charging



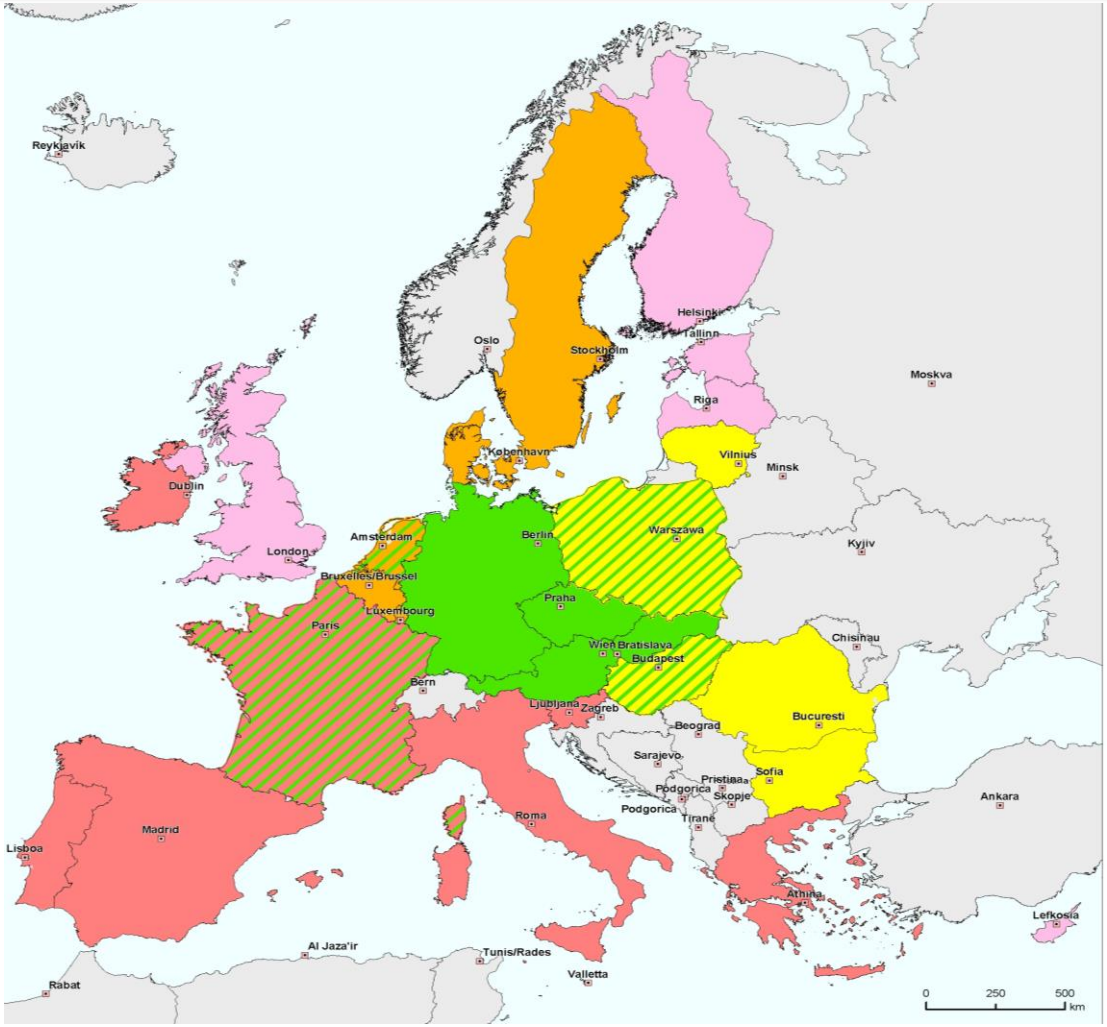
Austria
Introduction paper vignette: 1997
Electronic HGV charging: 2004

Czech Republic
Introduction paper vignette: 1995
Electronic HGV charging: 2007

Poland
Introduction paper vignette: 2002
Electronic HGV charging: 2011

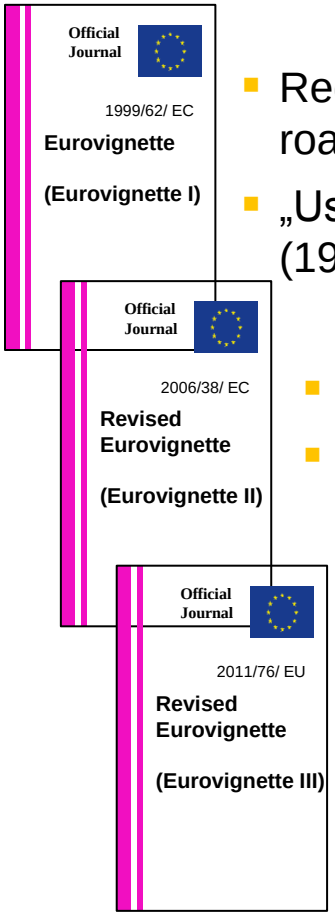
Road user charging in the EU, HGV schemes.

- Integrated electronic network-wide toll collection
- Eurovignette
- National vignettes
- Toll collection with physical barriers on the main motorways
- Neither vignettes nor tolls
- Integrated electronic network-wide toll collection under preparation

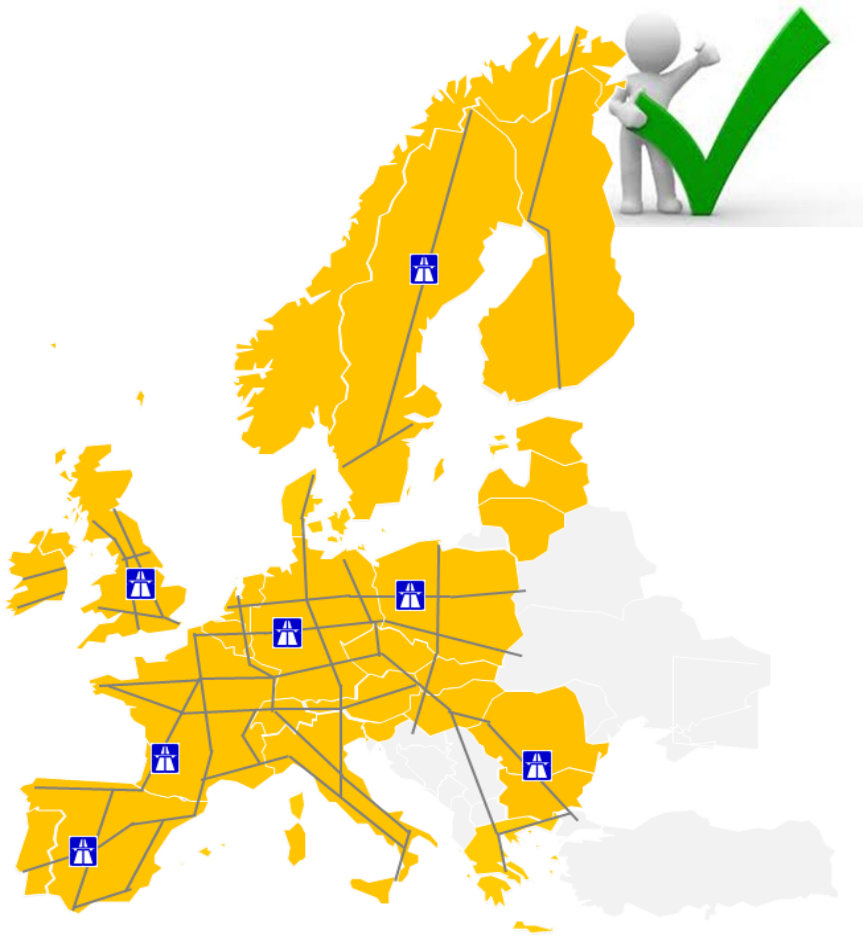


Source: EU DG MOVE, 2010

Legislative aspects, development of the “user & polluter pays” principles.

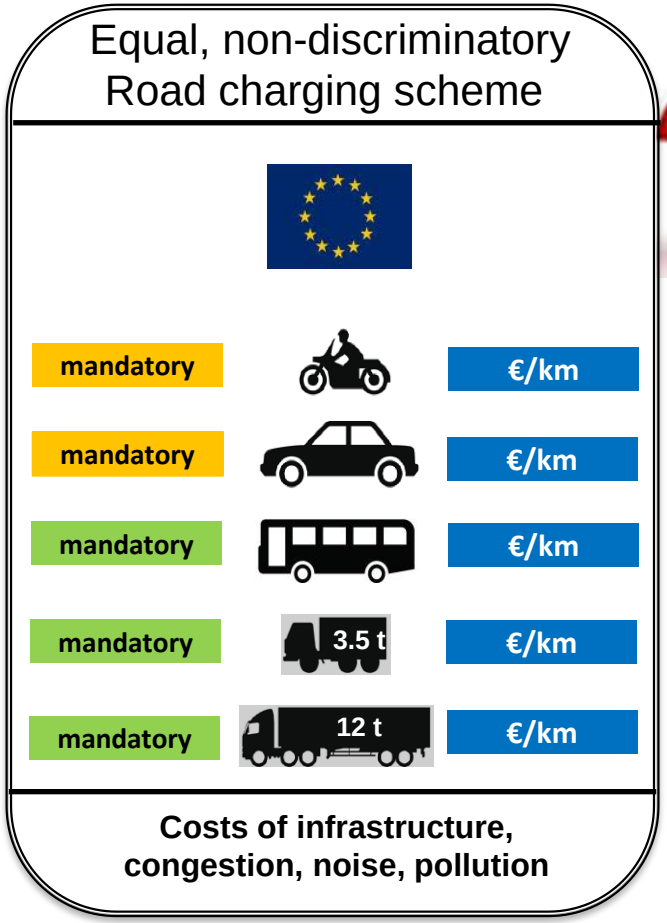


- Regulates and prevents discriminating road user charges on motorways
- „User pays principle“ for HGVs > 12t (1999)
- Introduction of emission classes
- “Polluter pays“ for HGVs > 3.5t (2006)
- Calculation scheme to internalize external costs (noise, congestion, air pollution) (2011)



Art 191/2 EU Treaty: “..the polluter should pay”

Legislative apsects, fair and effective application of rules.



The user pays

- Consistent application of “user- and polluter pays” principles
- Phasing out vignettes, make tolls the only legal way of charging vehicles for road use (time- distance-based, dynamic pricing according time/place)
- Replacing distortionary taxes and subsidies with fair pricing (e.g. OECD policy recommendations for Austria, 2013)
- Non-discrimination, Proportionality, Fairness

Value Pricing

- user acceptance through transparency and revenue allocation (.. as important as revenue neutrality; OECD/ITF 2010)

Art 18 EU Treaty: Non-discrimination on grounds of nationality

From business case to solution.

Requirements, charging schemes and scaling scenarios.

1 General requirements

System access

Easy, equal, fair
Who bears equipment costs?
Logistics
Payment alternatives

Interoperability

With other RUC schemes
With other service providers

2 Tolling scheme – questions

Type of tariff (time/distance)

What infrastructure to be charged?

Vehicles to be charged?

Legal framework for enforcement

3 Scaling scenarios

Migration vehicles & network

HGV > 12t; HGV > 3,5t; Passenger cars
Primary road network; lower levels; zones

Migration Road Pricing

Time, Distance (static, variable, dynamic)

Total cost of ownership over time, CAPEX & OPEX.

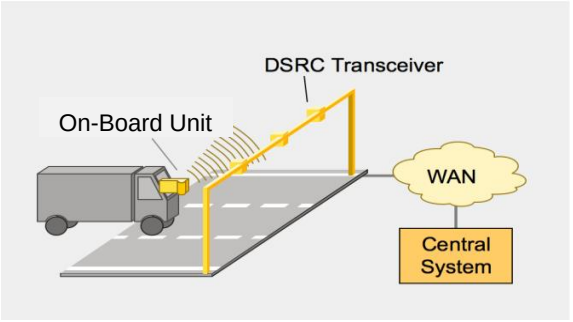
Subsystems of ETC MLFF Systems / Open Road Tolling (ORT)

Roadside Stations

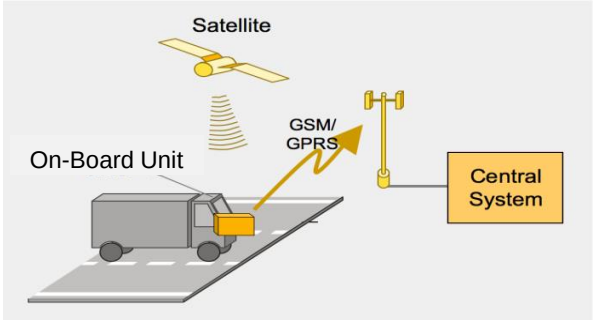
Enforcement

Back Office

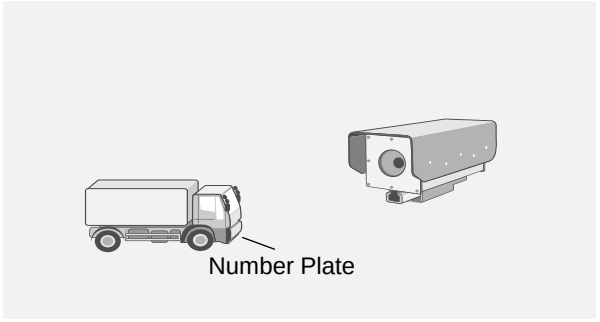
Core Technologies for ETC Systems



Dedicated Short-Range Communication



Global Navigation Satellite System



Automatic Number Plate Recognition

Conclusions, Sum-up Key aspects.

Sum-up Key aspects.

From Patchwork to Network

- “User”- and “Polluter pays” principle on TEN-T.
- Interoperable, distance-based charging scheme for HGV replacing across Europe time based charges.

Policy

- Gradually replacing transport system taxes with more effective instruments, Road pricing.
- Expansion of tolling to all vehicle types?

Technology follows Business case

- ETC systems are tools to (re)finance infrastructure.
- Solution derives from Road user charging requirements and scaling scenarios.

Kapsch TrafficCom AG

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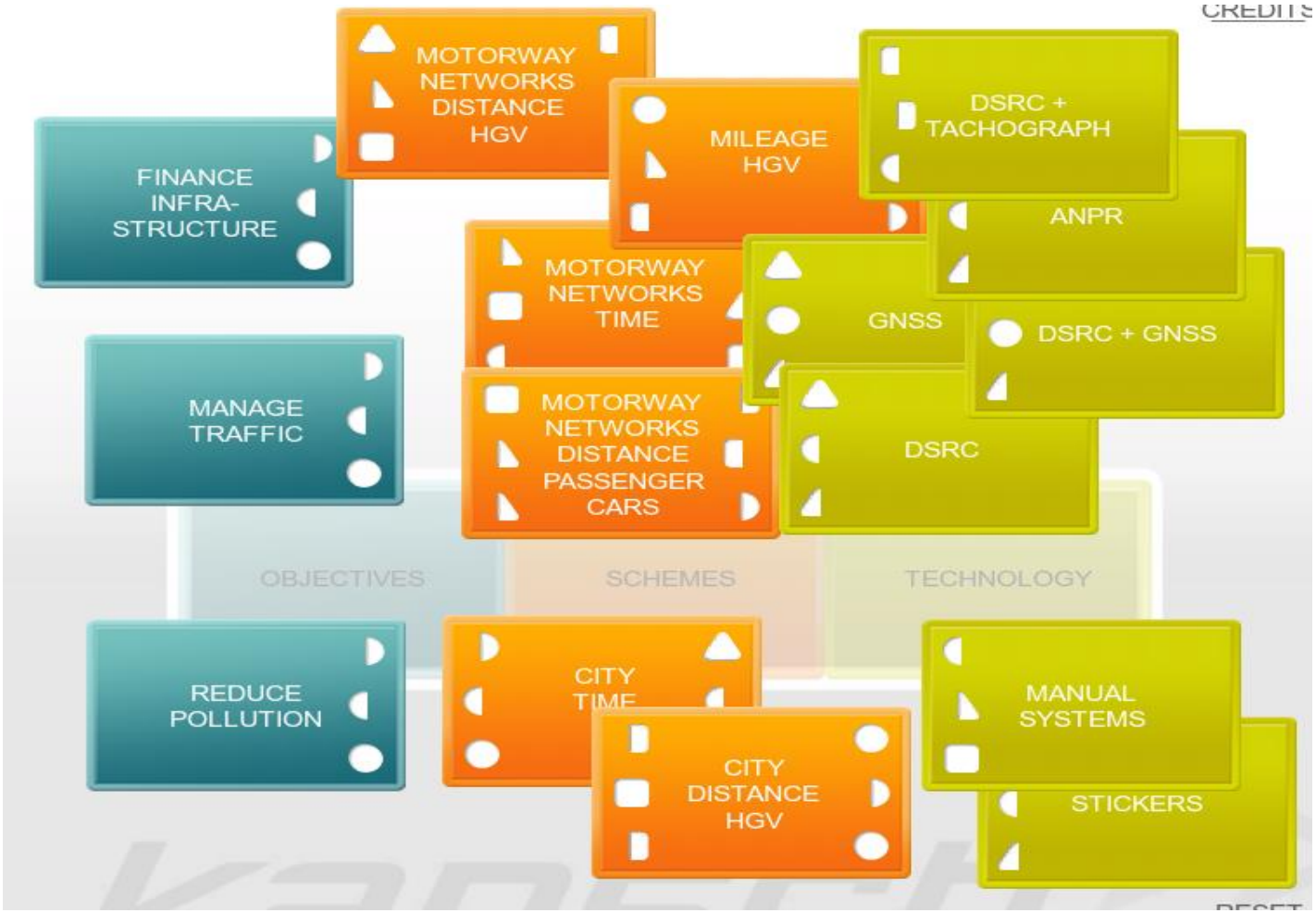
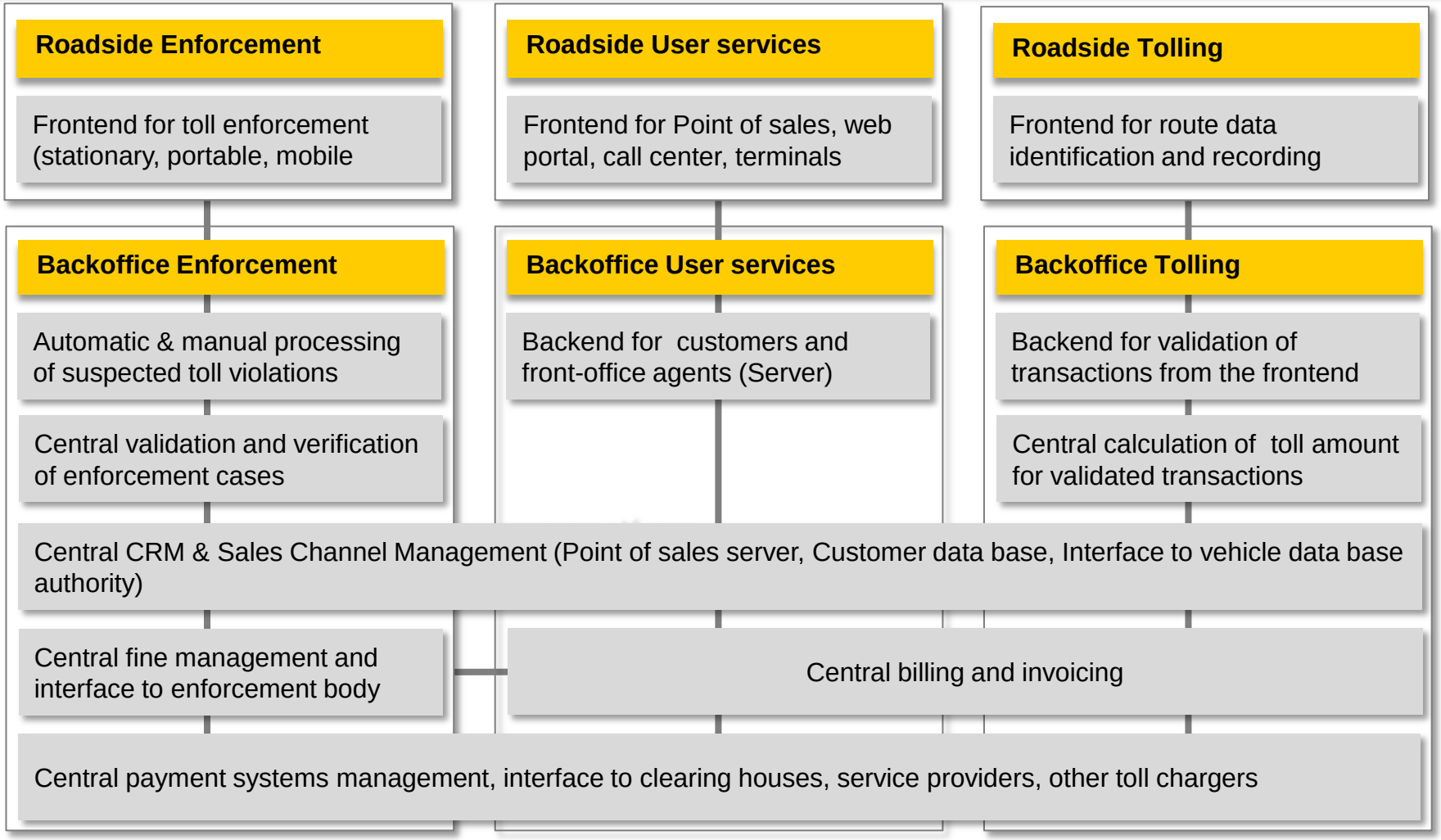
Kapsch Road Charging Puzzle



Backup Slides

Components of a generic ETC free-flow system



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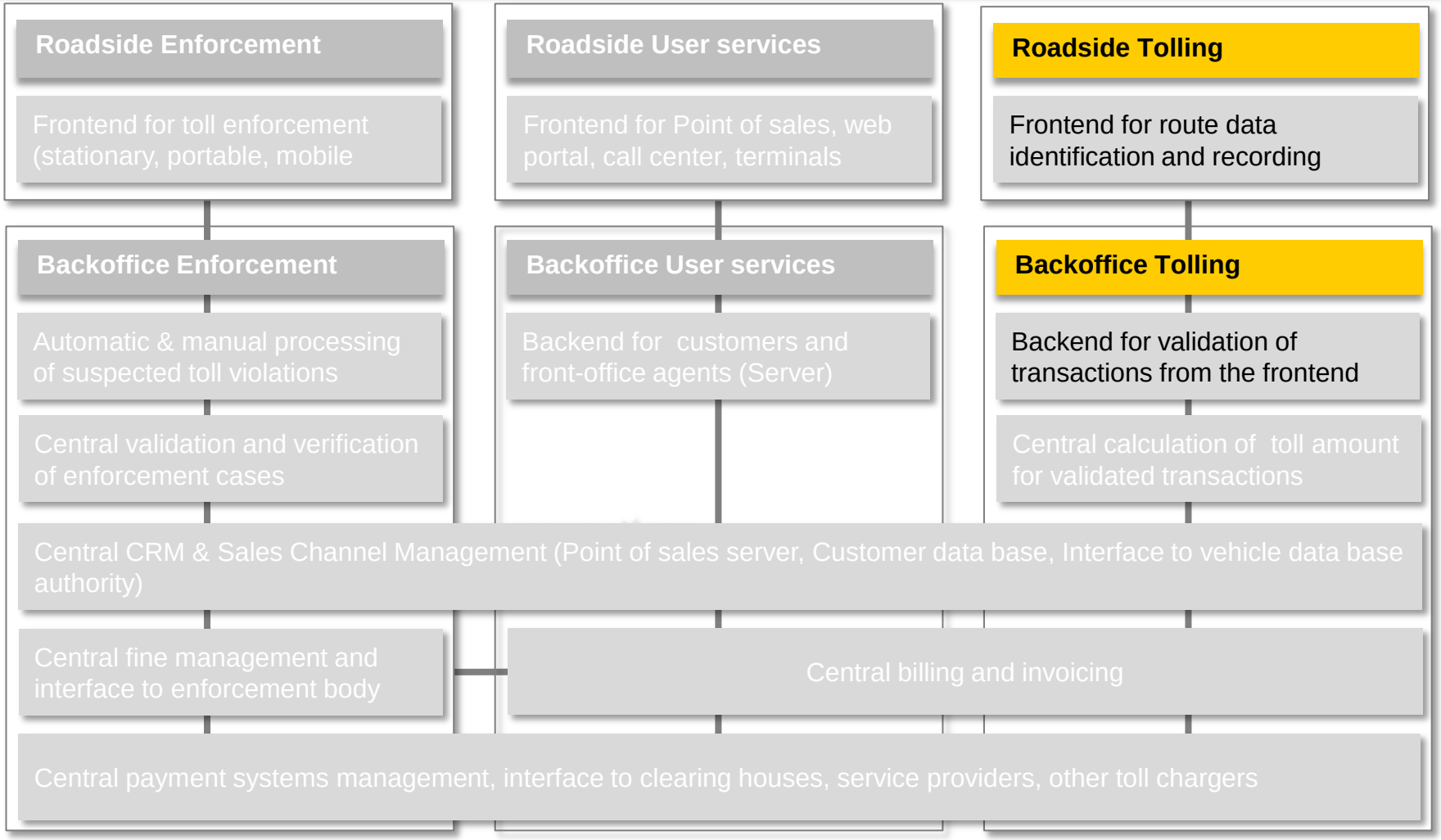
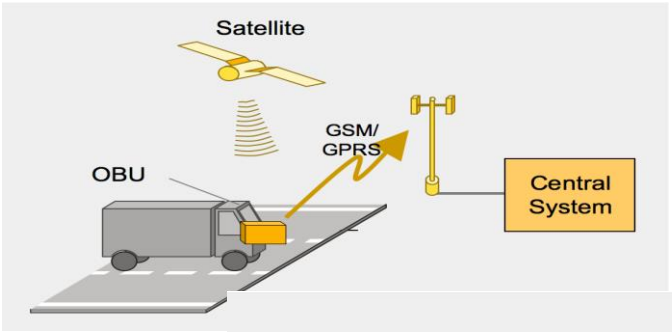
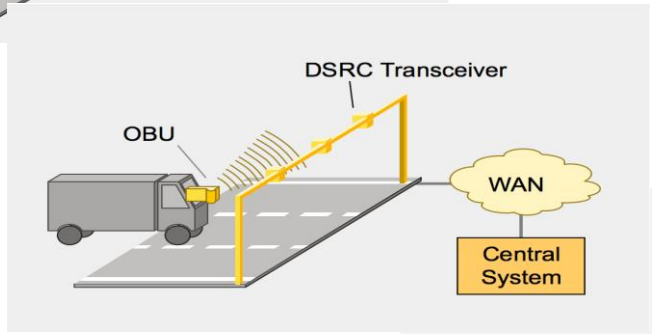


Technological options and ETC core technologies



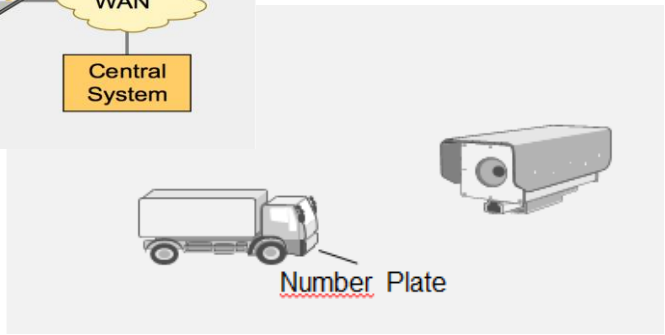
Roadside Tolling

Frontend for route data identification and recording



Backoffice Tolling

Backend for validation of transactions from the frontend



Roadside Enforcement	Roadside User services
Frontend for toll enforcement (stationary, portable, mobile	Frontend for Point of sales, web portal, call center, terminals

Backoffice Enforcement	Backoffice User services
Automatic & manual processing of suspected toll violations	Backend for customers and front-office agents (Server)
Central validation and verification of enforcement cases	

Central calculation of toll amount for validated transactions

Central CRM & Sales Channel Management (Point of sales server, Customer data base, Interface to vehicle data base authority)

Central fine management and interface to enforcement body

Central billing and invoicing

Central payment systems management, interface to clearing houses, service providers, other toll chargers

Automatic number plate recognition (ANPR)

High operating costs for toll enforcement (about 5% of tolled vehicle volume to be processed manually)

No logistics costs OBU handling

No invest- and operating costs for in-vehicle equipment (OBU); Need for ANPR roadside infrastructure; Validation rate about 95%

Roadside Enforcement	Roadside User services	Roadside Tolling
Frontend for toll enforcement (stationary, portable, mobile	Frontend for Point of sales, web portal, call center, terminals	Frontend for route data identification and recording
Backoffice Enforcement	**Backoffice User services**	**Backoffice Tolling**
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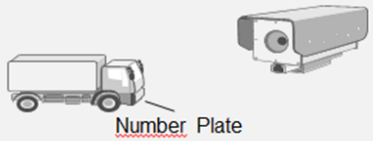
ANPR



Method based on video images applying optical character recognition (OCR) on images to automatically identify the license plate number of vehicles.

Dedicated short-range communication (DSRC)

Moderate operating costs for toll enforcement (about 1% of tolled vehicle volume to be processed manually)

Logistics costs OBU handling

Moderate invest- and operating costs for in-vehicle equipment (OBU); Need for DSRC roadside infrastructure; Validation rate above 99%

Roadside Enforcement	Roadside User services	Roadside Tolling
Frontend for toll enforcement (stationary, portable, mobile	Frontend for Point of sales, web portal, call center, terminals	Frontend for route data identification and recording
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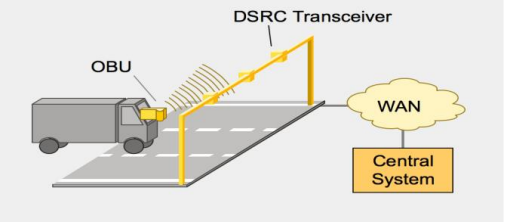
DSRC



One- or two-way short- to medium-range wire-less communication channels for communication between on-board and roadside equipment.

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Global navigation satellite system (GNSS)

Moderate operating costs for toll enforcement (about 1% of tolled vehicle volume to be processed manually)

Logistics costs OBU handling (similiar to DSRC)

High invest- and operating costs for in-vehicle equipment (OBU); No need for roadside infrastructure; Validation rate above 99%

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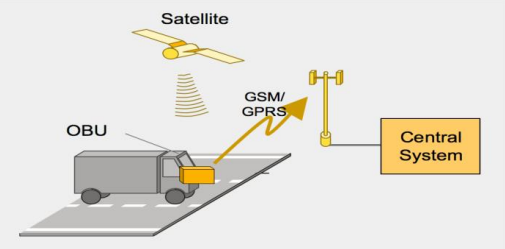
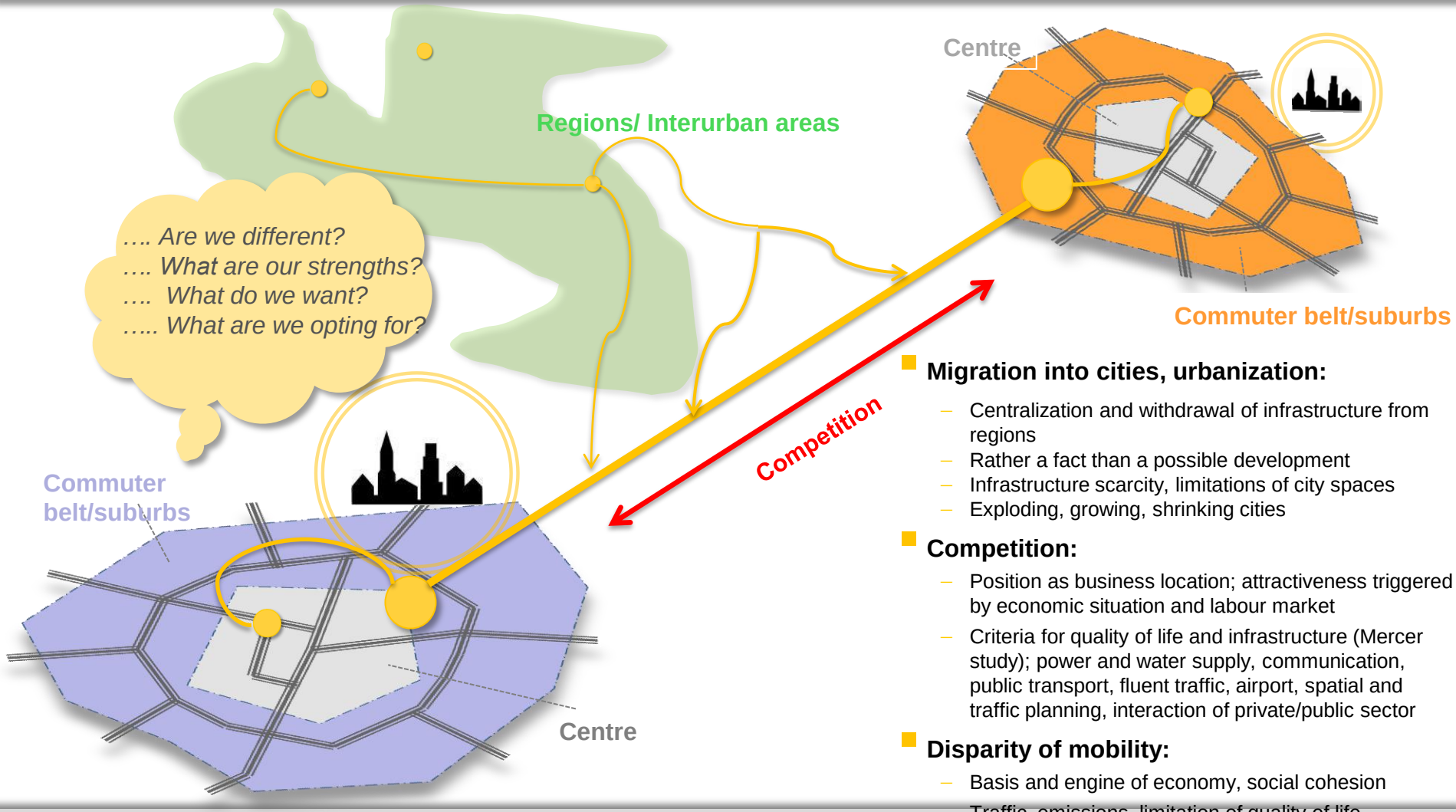
GNSS



Identification of passed toll sections based on GNSS positions of the vehicle.

Situation. Cities and communities in transition and competition.



- **Migration into cities, urbanization:**
  - Centralization and withdrawal of infrastructure from regions
  - Rather a fact than a possible development
  - Infrastructure scarcity, limitations of city spaces
  - Exploding, growing, shrinking cities
- **Competition:**
  - Position as business location; attractiveness triggered by economic situation and labour market
  - Criteria for quality of life and infrastructure (Mercer study); power and water supply, communication, public transport, fluent traffic, airport, spatial and traffic planning, interaction of private/public sector
- **Disparity of mobility:**
  - Basis and engine of economy, social cohesion
  - Traffic, emissions, limitation of quality of life

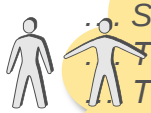
Strategy, what to do. Regulative framework for local road user charging and access schemes.

…. City as a system; energy management, water, waste, assisted living, traffic management
…. Aspects; political, functional (system), environmental, human, economic
…. Role of the government is to operate the system and to organize "smart" technology …..

MOBILITY

- *To decouple growth of cities and resource consumption*
- *To use digital data*
- *Incenting people to use environmentally friendly modes*
- *Cross-regional land use planning*
- *Three tuning levels for decision makers*
  - *Manage supply*
  - *Manage human demand*
  - *Make infrastructure adoptive*

…. Short distances
…. Trip planning reliability
…. To contribute to a cleaner environment
…. Willing to pay for adequate level of service and better quality of life



Local Empowerment:

- Self-definition, Positioning
- Fiscal powers for road user charges

….. leads to improvement of the price/ performance ratio of the public service

….. user acceptance through transparancy

and use of funds (... As important as revenue neutrality … OECD/ITF 2010)