# Kapsch TrafficCom – Snapshot

## Scope of business:
- Turn-key solutions, component sales and operations of road infrastructure related ITS and traffic management solutions (focus: road user charging systems)
- 20 years of experience in electronic tolling (+230 references in 41 countries)

## Offering:
- Research & development of core technologies, systems & products (own manufacturing); system planning, implementation, integration & roll-out; technical & commercial operations of systems

## Selected references:
- Nationwide Tolling (Truck Tolling) (Eastern Europe)
- Object Tolling (All vehicle tolling) (Oceania, SA, South Ame.)
- Urban Tolling (City Charging/Access Restriction) (Europe)

## Number of employees:
- 3000+ worldwide

## Locations:
- Headquarters in Vienna (Austria)
- Development centers in Austria, Argentina, Sweden and USA
- Sales offices in 23 countries
Electronic Toll Collection Overview
Objectives of Toll Collection

I. Financing of traffic
- Typically a mixture of financial tools is being applied (tolling is one of them)
- Fair pay per use principle
- Provides a maximum in flexibility in pursuing specific transport policy aims (traffic management, environmental protection)

II. Traffic management
- Making users more aware of the costs of road use
- Regulating traffic demand
- Static, variable, and dynamic pricing

III. Environmental protection
- More and more tolling plays an essential role in the greening of transport
- Allows to cut down emissions by reducing traffic
- Allows to promote low emission engines through low tariffs
ETC Schemes - Overview

**Nation Wide Tolling**
- Highways / federal roads (/rural roads)
- Financing, traffic management, environmental protection
- Distance-based or time-based
- Truck-tolling
- Short range communication, GNSS, or Hybrid
- Example: Czech, Austria, Poland

**Object Tolling**
- Highway Concessions, Tunnels, bridges
- Financing
- Distance-based
- MLFF and Conventional tolling (manual / ETC single lanes)
- All vehicles
- Short Range/ANPR
- Examples: Australia, New Zealand, Chile, South Africa, India

**Urban Tolling & Access Restriction**
- City centers
- Financing, traffic management, environmental protection
- Tolling, access restriction, low emission zones
- Static or variable pricing or driving bans/restricted access
- All vehicles
- Short range/ANPR
- Examples: Italy, Norway, Germany
ETC Technologies

Short-range communication ETC systems (DSRC):
- EU: 5.8 GHz CEN DSRC (US: 915 MHz/5.9 GHz WAVE)
- Standardized (e.g. 5.8 CEN DSRC) > Interoperability
- Low cost onboard units
- Low operational costs (no over-the-air data transfer)
- Highest accuracy
- Roadside stations needed
- Infrastructure can be shared with other applications

Satellite positioning ETC systems (GNSS):
- GNSS (Global Navigation Satellite Systems)
- GPS, GLONASS, GALILEO
- Thin client vs. thick client
- More expensive onboard unit
- Higher operational costs (over-the-air data transfer)
- No roadside equipment (flexibility)

Video ETC systems (ANPR):
- ANPR (Automated Number Plate Recognition)
- Vehicles don’t have to be equipped with an onboard unit
- Ideal for city environments
- Manual verification needed (no 100% capturing rate)
Choosing the right ETC Technology ("ETC Technology Matrix")

<table>
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<th>Hybrid sample:</th>
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Hybrid sample:
- DSRC
- GNSS

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Sample System: Kapsch Area (Hybrid DSRC/GNSS)

Overview:
- Kapsch Area is a hybrid system based on GNSS/GPRS and DSRC technologies; it allows a combination of DSRC tolling on highways and other main roads and GNSS tolling where roadside infrastructure possibilities are limited.

How it works:
- Vehicles are equipped with a hybrid DSRC/GNSS OBU.
- OBU works in short-range mode on “DSRC routes”.
- OBU automatically switches to GNSS/GSM on other roads.
- Pure GNSS operation is possible too.

Highlights:
- Hybrid system providing a maximum in flexibility.
- Combines the benefits of DSRC and GNSS.
- High level roads with heavy traffic can be tolled using DSRC (high accuracy, low operational costs).
- Lower road network can be tolled using GNSS (no roadside stations needed).
Kapsch Area / System Overview

Onboard Unit with GPS & GSM/GPRS Module

GPS Location Points

Transactions

Central System

Road Side: GPS/GSM Thin Client

Road Side: Other System (e.g. DSRC)

Firewall & Router

Communication Server

Map Matching Center

Transactions Collector

Map

Tariff

Operational Back Office

Commercial Back Office

Contract data (vehicle & user data)

Central System

WAN

GPRS

System Monitoring

Data Warehouse

Central Data Repository

Transactions

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ETC - Kapsch Solutions
Enforcement

Overview:
- Enforcement has to be an integral part of each tolling system ensuring that fraud is being reduced to a minimum, securing the income of the road operator and ensuring fairness to all road users

How it works:
- Requires a network of automated and manual enforcement means
- Automated enforcement stations detect potential violators
- Manual verification of incidents in the enforcement center
- Mobile enforcement for catching violators and for on-site checks

Available enforcement systems:
- Fixed enforcement stations (for permanent compliance checking at strategically important locations)
- Portable enforcement equipment (> surprise effect)
- Mobile enforcement vehicles for on-site checks of flowing traffic
- Handheld devices for manual checks at rest areas etc.
- Enforcement center (as part of the back office system)
**Tags**

- Kapsch TS3203 mini tag for passenger cars / 5.8 GHz CEN DSRC
- Kapsch OBUs for heavy goods vehicles with integrated MMI / 5.8 GHz CEN DSRC
- Kapsch TS3209 hybrid DSRC/GPS on-board unit suitable for passenger cars as well as heavy goods vehicles
- Kapsch IVHS E-Zpass / 915 Mhz
Kapsch References - Worldwide.

- Austria
- Norway
- Denmark
- Netherlands
- United Kingdom
- Ireland
- Germany
- France
- Portugal
- Spain
- Switzerland
- Italy
- Slovenia
- Sweden
- Czech Republic
- Poland
- Hungary
- Turkey
- Serbia
- Greece
- Montenegro
- Russian Federation
- China
- Vietnam
- Philippines
- Australia
- Mexico
- Costa Rica
- Panama
- Colombia
- Ecuador
- Brazil
- Argentina
- Chile
- South Africa
- New Zealand
- Canada
- USA
- Chile
- Argentina
- South Africa
- Australia
- New Zealand
- Danish
- Netherlands
- United Kingdom
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- Italy
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- Sweden
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- Poland
- Hungary
- Turkey
- Serbia
- Greece
- Montenegro
- Russian Federation
- China
- Vietnam
- Philippines
- Australia
Thank you for your attention.

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