1st Institutional Investors’ Day.
January 11, 2017
Imagine a world in which...

Zero congestion
- Traffic jam becomes a rarity as sensors govern distance between vehicles and manage traffic patterns.

Zero emission
- Tailored vehicles enable more efficient and environmentally friendly mobility.

Zero accident
- Vehicles hardly ever crash once human error is removed from the equation.

Frictionless, automated, personalized travel on demand:
That’s the dream of the future of mobility.
We target two markets.

ETC | Electronic Toll Collection

- Enables drivers to pay toll fees without stopping at toll stations.
- Relatively mature, stable market,
- Limited number of suppliers.

IMS | Intelligent Mobility Solutions

- Support and optimize transportation, including infrastructure, vehicles, users and industry.
- Connected mobility & individual mobility services.
- Mutation of the car industry into a mobility business.
- Developing market, new innovative applications, many different players.
Let us start with ETC.

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ETC: Multi-technology approach required to be leading solutions provider globally.
Exemplary applications.

Multi-Lane Free-Flow Tolling
- All type of roads: mainly highways, expressways and other main roads.
- All type of vehicles: e.g. HGVs, all vehicles.
- DSRC* and/or ANPR; Managed lanes.

Satellite Tolling
- All type of roads from highways to rural roads.
- All type of vehicles: e.g. HGVs, all vehicles.
- GNSS, GSM, GPRS.

Mobile Tolling
- All types of roads: mainly highways, expressways and other main roads.
- All types of vehicles: e.g. HGVs, light vehicles.
- Adding smartphones as a new tolling product apart from DSRC* and/or ANPR; Video correlation.

eVignette
- All type of roads, mainly on high category roads, highways.
- Light vehicles.
- ANPR.

City Tolling
- Urban areas.
- All type of vehicles.
- ANPR, DSRC*, GNSS, but mainly ANPR based.

Plaza Tolling
- Concessions toll roads, high category roads, bridges and tunnels.
- All type of vehicles.
- DSRC* and/or ANPR.

*Standardized DSRC (dedicated short-range communication for RFID 915 MHz, ISO 18000-63, CEN 5.8 GHz, G5/WAVE 5.9 GHz).
Vision based sensor technology.

Next-generation vehicle detection and classification sensor.

Facilitates unprecedented performance levels on ETC operations.

Solution Description

- 3D stereo streaming video sensor and processor.
- Designed to detect, track, trigger and classify vehicles in real-time.

Competitive Edge

- Cost efficient single gantry geometry.
- Strong performance in all traffic and weather conditions.
- No embedded roadway sensors required.
It is more than just an app.

Solution Description
- Smartphone as tolling device for occasional drivers.
- Correlation of ANPR and GNSS transactions.

Competitive Edge
- Improves the customer journey.
- Reduces operational costs.
- Seamless integration into existing video toll collection systems.
Next generation back office system.

Purpose-built, for a modern tolling business environment.

Solution Description
- Integrated set of interconnected modules supporting automation of core tolling processes.

Commercial Back Office
- All customer related tasks.
- CRM functionality.

Operational Back Office
- IPS for video toll + violation processing.
- Validation of transactions & their rating.

Image Processing Solution
- Enhancing automatic validation rate by 2nd ANPR, Fingerprinting and image reference database.

Enforcement Back Office
- Involving external enforcement agencies.
- Support by mobile enforcement.

Competitive Edge
- Multimodal capability.
- Web-based modern UI.
- Extensive experience in delivering new and upgraded back office solutions.
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Traffic management a core IMS application.


- High-performance, integrated software suite.
- Deployed for motorways and at vital transportation facilities around the world.
- Collects real-time traffic data and delivers it to Traffic Management Control (TMC) centers allowing operators to detect and respond to congestion, incidents, emergency situations, and other conditions.
- Travel times, incidents, roadway and weather conditions, and other messages can be quickly disseminated to the public allowing motorists to make informed travel decisions.
- DYNAC used in collaborative CHARM program: ATMS for Highways England (UK) and Rijkswaterstaat (NL).
Further IMS applications.

- **Smart Parking**
  - Smartphone based user guidance*
  - Parking availability inference via data analytics and IoT
  - City parking management and enforcement apps

* enabled by Streetline

- **Urban Traffic Management**
  - EcoTrafiX™ traffic management software for city*
  - Advanced event management tools
  - Data Analysis and Data Mart

* enabled by Kapsch TrafficCom Transportation

- **Multimodal Mobility Service**
  - Software solution for efficient and fast implementation of mobility services*
  - Output for travellers via all major channels and operating systems, e.g. smartphones, tablets, web, smartwatch

* enabled by Fluidtime

- **Connected Vehicles**
  - V2X roadside products
  - V2X for ADAS
  - V2X for efficiency
V2X use cases.

**Highway**
- Multimodal Information
- Next train in 6 min
- Road Work
- Next Work Warning
- Slow down!
- Congestion Warning

**Urban**
- Request for green
- 20 km/h for green
- Public Transport Priority
- Green in 76
- Speed Advice
- Force green
- 80 km/h for green
- Speed Advice

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**V2X exemplary applications.**

**V2X Roadside Products**
- 5.9 V2I localization and non-localized Roadside Units.
- 5.9 parking antennas.

**V2X for ADAS**
- Automatic Emergency Break.
- Collision Warning.
- Do not pass warning.

**V2X for efficiency**
- HGV Platooning.
Solution Center Concept.
## Solution Center organization.

### Solution Centers (structured by economic buyer)

**Tolling Solutions**
- Explore technology breakthrough innovation.

**Back Office Solutions**
- Harmonize technology frameworks and drive the consolidation of the product portfolio.

**Highway & Tunnel Traffic Management Systems**
- Standardize and enforce commonly used tools, guidelines etc.

**Urban Traffic & Mobility Management Solutions**
- Develop products and sub-systems on request of the Solution Centers.

**Intelligent Mobility Services**

**Connected Vehicles**

### R&D

- Explore technology breakthrough innovation.
- Harmonize technology frameworks and drive the consolidation of the product portfolio.
- Standardize and enforce commonly used tools, guidelines etc.
- Develop products and sub-systems on request of the Solution Centers.
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