The OBU: Core Component for Tolling & Telematics

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We are at a Milestone for Mobility -
Facts and Dependencies

- The market provides excellent **cars**
- **Trucks** transport more freight than ever
- **Mobility** becomes the factor #1 for prosperity, wealth and industrial growth
  But this depends on.....
- State of the art **road networks** and.....
- ...... **Communications** form the **basis**

Lack of **financing** in order to maintain, re-build, construct, widen, improve the network

Lack of **intelligence** inside and alongside the vehicle to reach **optimum flow** of traffic and efficient **traffic control**. General: make use out of the tons of data produced daily!
Challenges to Secure Mobility -
Main Drivers to be Addressed

Tackle congestion

Traffic management

Financing road infrastructure

Improvement in efficiency of fleets
Manual and DSRC Tolling -
Proven Technology with Limitations

Tolling as we know it today: **manual** or **DSRC-based**

- A working **reliable technology**
- Financing instrument for **dedicated roads** only
- Low cost in vehicle-tag versus....
- **High infrastructure** expenses (each road section!)
- Hardly any possibility for **value added services**
- **Profitability** depends on high amount of users
Solution: Satellite based Electronic Tolling - 
Proven, Reliable and Successfully Implemented

- Future intelligent transportation applications will use this **state-of-the-art** technology (successfully tested world-wide; operating systems implemented)
- Possibility to combine **traffic control** and **financing** issues
- On-Board Unit device has all necessities to deliver **value added services**
- Due to the technology and its flexibility this technology really enables **traffic guidance** and **tackle congestion**; **low infrastructure costs**
- Road network **expansion/modification** any time / any place
Satellite-Based Electronic Tolling -
The OBU - The Core Component

3 major components in every Electronic Tolling System:

- **On-Board Unit**
- **Charging Data**
- **Enforcing Data**

**Electronic Toll System**

Central Services

Integrating the OBU into the overall system comprising communication and Back Office system
Telematics -
A Wide Range of Use Cases Based on Satellite technology

Tolling

Electronic Toll System

Telematics

C2I

Tracking

e-call

Traffic Management Control Centre
### Fleets / Freight Forwarder
- Fleet management
- Fleet statistics
- Hazmat tracking
- Access to restricted zones
- Driver performance reporting
- **Digital Tachograph data**
- Container tracking

### Traffic Management Control Centre
- Traffic information
- Road usage / statistics
- Road status

### OEM / Brand specific services
- Remote diagnostics
- Remote maintenance
- Remote vehicle control
- Software download
- E-/B-call
- Roadside assistance

### Fleets / Freight Forwarder
- Pay-As-You-Drive (PAYD)
- Lost/stolen vehicle
- Remote immobility
- Driver performance

### Insurance companies
- Toll revenues
- Road status
- Road usage / statistics

### Toll Operator / Road Owner
- Voice, e-mail, SMS, MMS
- Internet, etc.
- Location based services
  - "Find my friend"
  - Infotainment
  - Entertainment

### Private services
- Telematics OBU - Multi-Purpose Device Delivering Value Added Services
- Voice, e-mail, SMS, MMS
- Internet, etc.
- Location based services
  - "Find my friend"
  - Infotainment
  - Entertainment
Digital Tachograph Datamanagement via OBU - Use of existing devices and installations

Company Card

OBU

CAN Bus

Toll Collect Server

Gateway Company

Service Provider

Final customer

IP

GSM Net

Tolling data

Company Card

Driver Card

Company Card
The satellite based On-Board Unit -
Necessities To Be Fulfilled

Platform for Tolling & Telematics

Interoperable
Secured data transfer
Secured against fraud
Utmost reliability
Fully automotive compliant device
Software update via communication interface
Easy adaptation to customer requirements
Easy installation: "plug & play"

Tolling OBUs

increasing Requirements

Telematics OBUs
## The Tolling On-Board Unit -
Special requirements for the device & the supplier

### Requirements: the challenges from the existing tolling schemes

<table>
<thead>
<tr>
<th><strong>OBU</strong></th>
<th><strong>Supplier</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully automotive <strong>compliant</strong> + CE &amp; e1 homologation</td>
<td>High <strong>production</strong> capacity</td>
</tr>
<tr>
<td>Highest <strong>reliability</strong></td>
<td>Tolling References</td>
</tr>
<tr>
<td>High <strong>security level</strong></td>
<td>Technology <strong>know how</strong></td>
</tr>
<tr>
<td>Highest <strong>quality level &amp; GPS</strong> performance (also with int. antennas)</td>
<td>Stability</td>
</tr>
<tr>
<td><strong>Future-oriented</strong> platform concept</td>
<td>Long term <strong>strategy</strong></td>
</tr>
<tr>
<td><strong>Modern/powerful System architecture</strong> to run tolling application SW</td>
<td>Service concept &amp; service <strong>network</strong></td>
</tr>
<tr>
<td><strong>Realization of real interoperability</strong></td>
<td>Short development <strong>cycles</strong></td>
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</tbody>
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OBUs from Siemens VDO's

It's Evolving: Meeting Every Customer's Requirements

2004+ ongoing
German "LKW Maut":
> 400,000 OBUs

2007+ ongoing
OEM Telematics OBU
150,000 OBUs

2008+
Hybrid Windshield Tolling

2008+
Swiss LSVA: Tolling 2nd generation
70,000 OBUs
Interoperable
CH ↔ I
CH ↔ A

2005+
Insurance Telematics OBU
50,000 OBUs
Modular concept for the OBU -

*It Is the Customer Who decides – We Have The Expertise*

### Basic equipment
- GPS high sensitivity receiver
- GSM SIM-Card
- Microcontroller
- SD RAM
- Power Management
- Security Module
- Housing Switch
- Flash

### I/O Ports
- CAN-bus

### Customers requirements
- GSM/GPRS module
- Internal DSRC module
- Rechargeable Battery
- Internal GPS/GSM antenna
- Voice I/O
- Bluetooth
- Chipcard reader
- HMI (Display, buzzer, LED)
The OBU roadmap
*Go for customer needs: Continuous improvement*

**Stand-alone solutions**

- Windshield Hybrid OBU
- Swiss Hybrid OBU
- High end Telematic OBU for India
- Toll Collect DIN Slot Hybrid OBU
- Toll Collect Dashboard Hybrid OBU

**Integrated Solutions**

- Passenger car OBU
- Integrated Toll Module

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Siemens VDO stands for:

- **Independent** OBU supplier
- **Worldwide production capacities**
- Dedicated to **automotive requirements**
- **Existing references**
- **Integration** capability
- **Reliability & stability**

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Combination of GNSS Tolling and Telematics -

Meaningful – Nevertheless Both Should Not Act Separately

GNSS-based systems (Tolling/Telematics) do not exclude each other – they both serve as the platform for another.

This technical platform will finally act as the enabler for a variety of value added / Telematics services.

Decrease in price and the maturity of the technology make these systems affordable and economically justified.

Satellite based technology covers all privacy requirements and is the best way to bring intelligence on/alongside the road.

The technology is in use for Telematics as well as for tolling.
Thank you very much for your attention!