Road Safety: Technologies and Solutions

2nd ASECAP Road Safety Event Prague – 1st March 2010

Alexander Abl
Solution Manager Safety Systems
Kapsch TrafficCom AG
Tolling as a Mainstay for Road Safety

New investments in road infrastructure
- Income is used for new infrastructure to increase road safety
- Traffic analysis for more goal oriented investments

Enhancement of road operation
- Income is used for a more sophisticated road operation
- Data from ETC used for more specific road user information

Indirect via transaction data from ETC system

Direct via income

Electronic Toll Collection System

Indirect via transaction data from ETC system
ASECAP Activities in Road Safety

• ASECAP is co-chairing the eSafety forum (together with ACEA and ERTICO)
  • Aims of eSafety are to promote the development and deployment of integrated road safety systems and it is driven by the European Commission
  • eCall as an example of an eSafety initiative. ASECAP coordinates all stakeholders interested in the quick implementation of a pan-European eCall service

• Memorandum of Understanding with Easyway
  • EasyWay aims a seamless ITS deployment all over Europe's main corridors

ASECAP is engaged in strategic ITS development in Europe
The ETC System as Basis for further ITS Applications

Electronic Toll Collection System

1. Traffic Information, Management & Planning
   - High accurate data through capturing traffic data from the toll system

2. Safety & Security
   - Improved safety and security through better traffic enforcement and observation

3. End-user Mobility Services
   - Better service for the driver through value added services

4. Industry Solutions
   - Additional revenues through utilizing the ETC infrastructure for implementing industry solutions

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Traffic Management System for CZ

Overview:

• Traffic management system on highway D1 (Prague - Brunn)
• Traffic and weather sensors
• CCTV
• Variable message signs
• Integration into Traffic Management Center (Ostrava)
Highway Traffic Management in CZ

- Provisioning of the data to the national traffic management centre in Ostrava
- Observing traffic using CCTV
- Detection of road surface conditions
- Sending information and warnings to road users (e.g. road works on 3 lanes)

→ Increasing Traffic Safety
→ Optimized Traffic Flow
The ETC System as Basis for further ITS Applications

Electronic Toll Collection System

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Traditional Speed Measurement (Advantages/Disadvantages)

**Mobile systems**
- Laser based
- Radar based
- Very efficient due to the surprise effect
- Are personnel-intensive and a continuous operation is not possible

**Video based speed and distance measurement**

**Stationary radar systems**
- Operate 24/7
- Effect is very local
Section Control Solution

![Diagram of Section Control Solution](image)

**SC distance**

**PC**

**HGV**

**START**

**END**

**Time**

Distance $= o_{city}$

Average Velocity $= \frac{Distance}{Time2 - Time1}$

**Evaluation unit**

**Maintenance and support working position**

**Traffic monitoring center**

**Vehicle registration database**

**Manual verification**

**On-site enforcement**

**Time1** = e.g. 09:50:00

**Time2** = e.g. 09:52:00
Combining Advantages – Section Control

- Average speed measurement combines the advantages of mobile and stationary speed enforcement
  - Reduce accident probability and severity on dangerous road sections
  - Reduce the average velocity on a longer road section
  - Harmonize traffic flow (avoid abrupt breaking at speed traps)
  - Reduce environmental pollution and noise (due to speed reduction)
  - Automatic operation (24/7)
- Extendable by additional system features
  - Distance measurement
  - Wrong way driver detection
  - Height check

![Change in Accidents vs. Change in Average Speed](image-url)
Improving Tunnel Safety - Incident Detection System

- Traffic jam and stopped car
- Wrong way drivers, wrong lane drivers
- Break down
- Smoke

Measurement of speed
Measurement of distance
Vehicle classification
Real Life Examples handled by the Kapsch IDS

Press report about wrong way driver in Tyrol

- Navigation device instructs 27 year old women to do a U-turn after missing an exit on the S16 in Tyrol/Austria
- She follows this instruction in the Strengen Tunnel
- An IDS recognized that and triggers an immediate information to other drivers
- **No accident happened!**

Accident in Semmering Tunnel S6/Austria

- A hazardous goods transport (empty but not cleaned) caught fire
- Load: leavings from iron chloride (e.g. used as rat poison)
- Video from the IDS alarming