

Successful Implementation of the Austrian electronic tolling system



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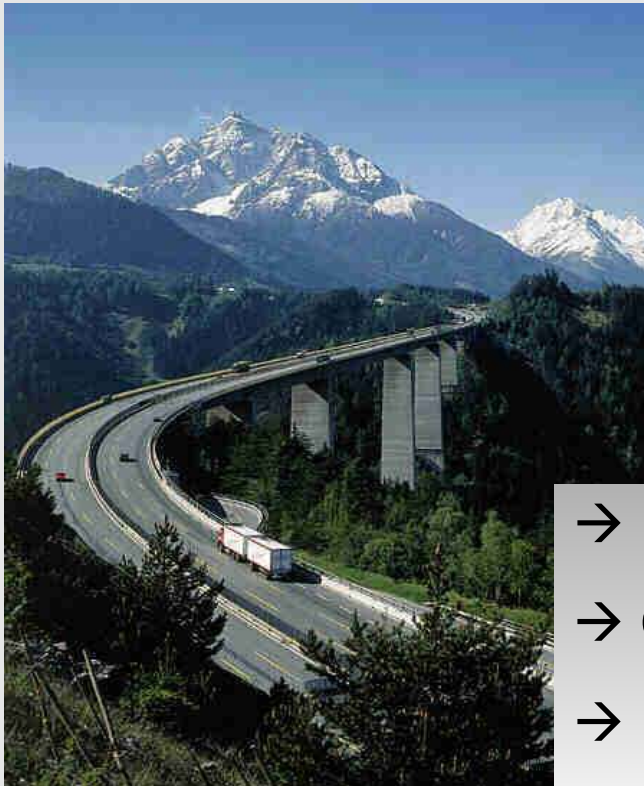
Agenda

1. ASFINAG

2. EFC System

- Technical decision
- Operation model
- Facts and Figures

1. ASFINAG



- Review
- Company structure, Route network
- Main tasks
- Vision – Intelligent Highway

ASFINAG

Company structure and route network



ASFINAG

Main tasks



New constructions

Operational Maintenance

Structural Maintenance

Tolls & Toll Sticker

2. EFC System: Technical decision and Operation model



- Technical decision
- Operation model
- Facts and Figures

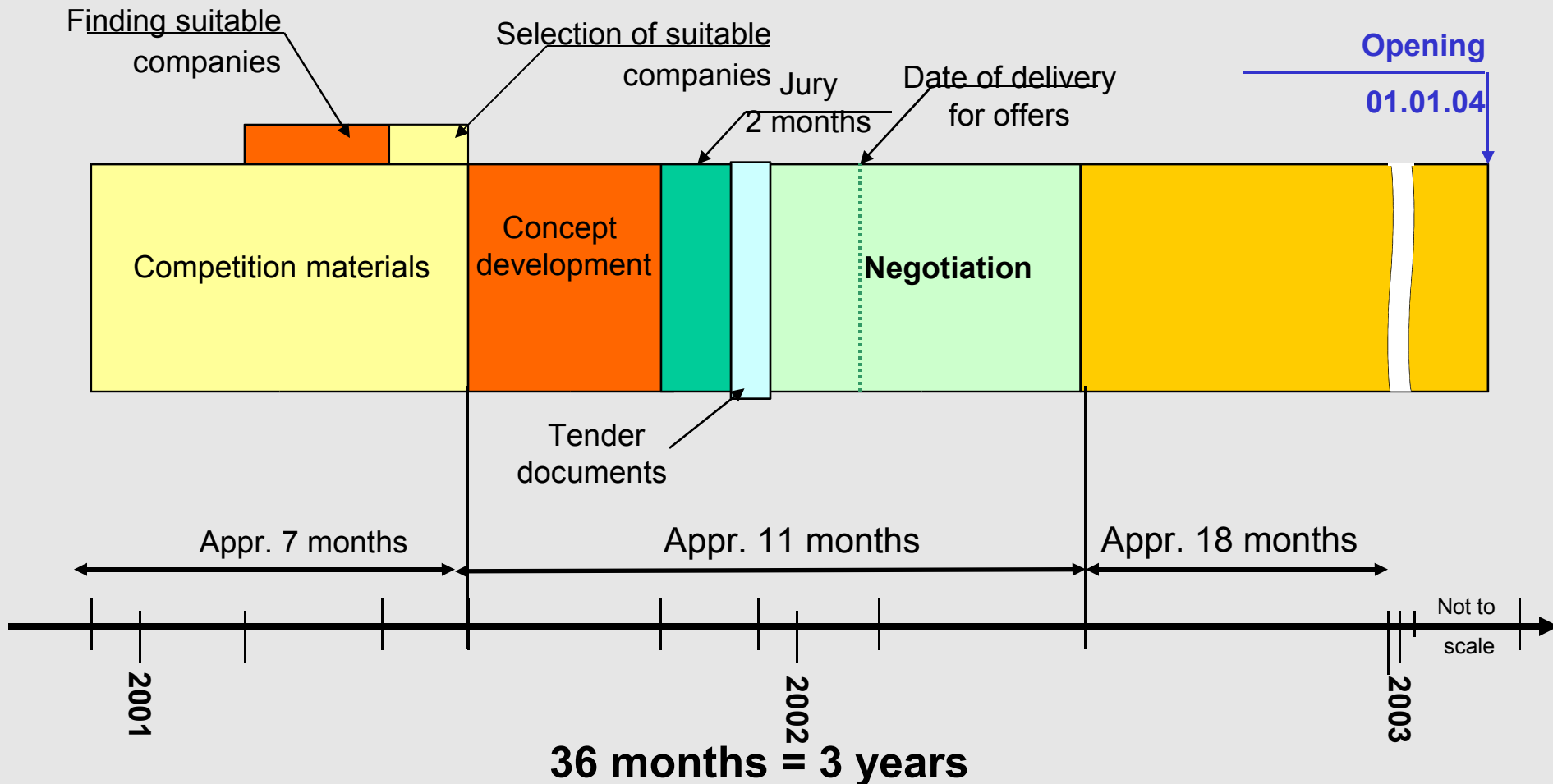
Starting position Nov. 2000:

- Toll stickers for vehicles < 12 tons
- 6 tolled sections (tolling by manual toll stations)
- Yearly loss of ASFINAG → 150 Mio. Euro
- **Need for additional financing sources**
- **Solution should be quick, effective and cheap!**
- Distance related toll for vehicles > 3,5 tons

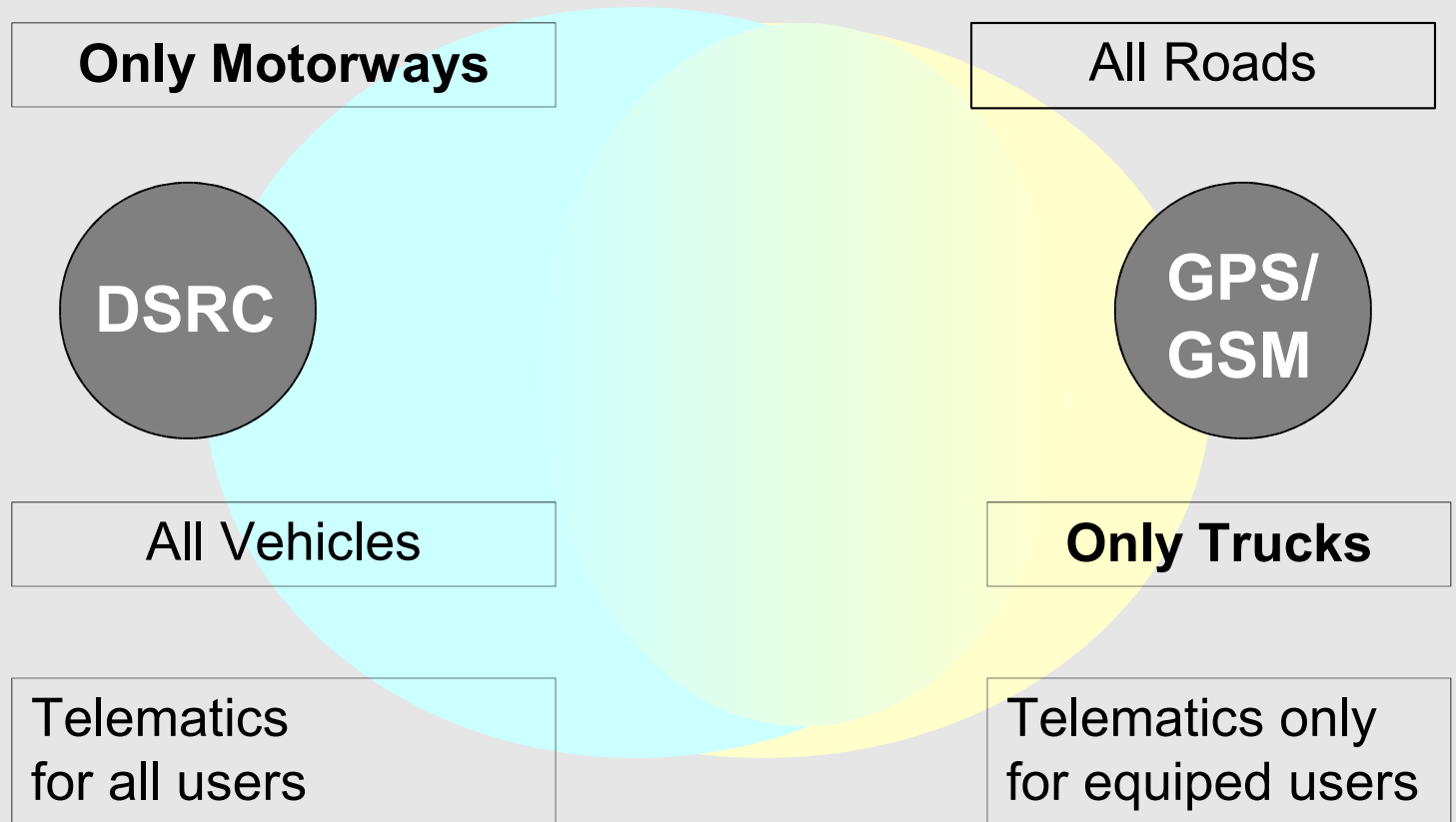
The main objects of the project

- **Operation of a system which allows levying road tolls**
 - on all vehicles with maximum weight of more than 3,5 tonnes
 - for use of primary road network (appr. 2.000 km)
 - with a possibility of own tariff rates on each section (around 400)
- **Tolls are based on the distance travelled and the type of the vehicle**
- **Rates differ according to the number of axles**
- **"Interoperability" with other European toll system**
- **TECHNOLOGICAL OPEN TENDER PROCESS FOR AN OPERATOR MODEL**

Main steps towards implementation



Technical decision
Fundamental

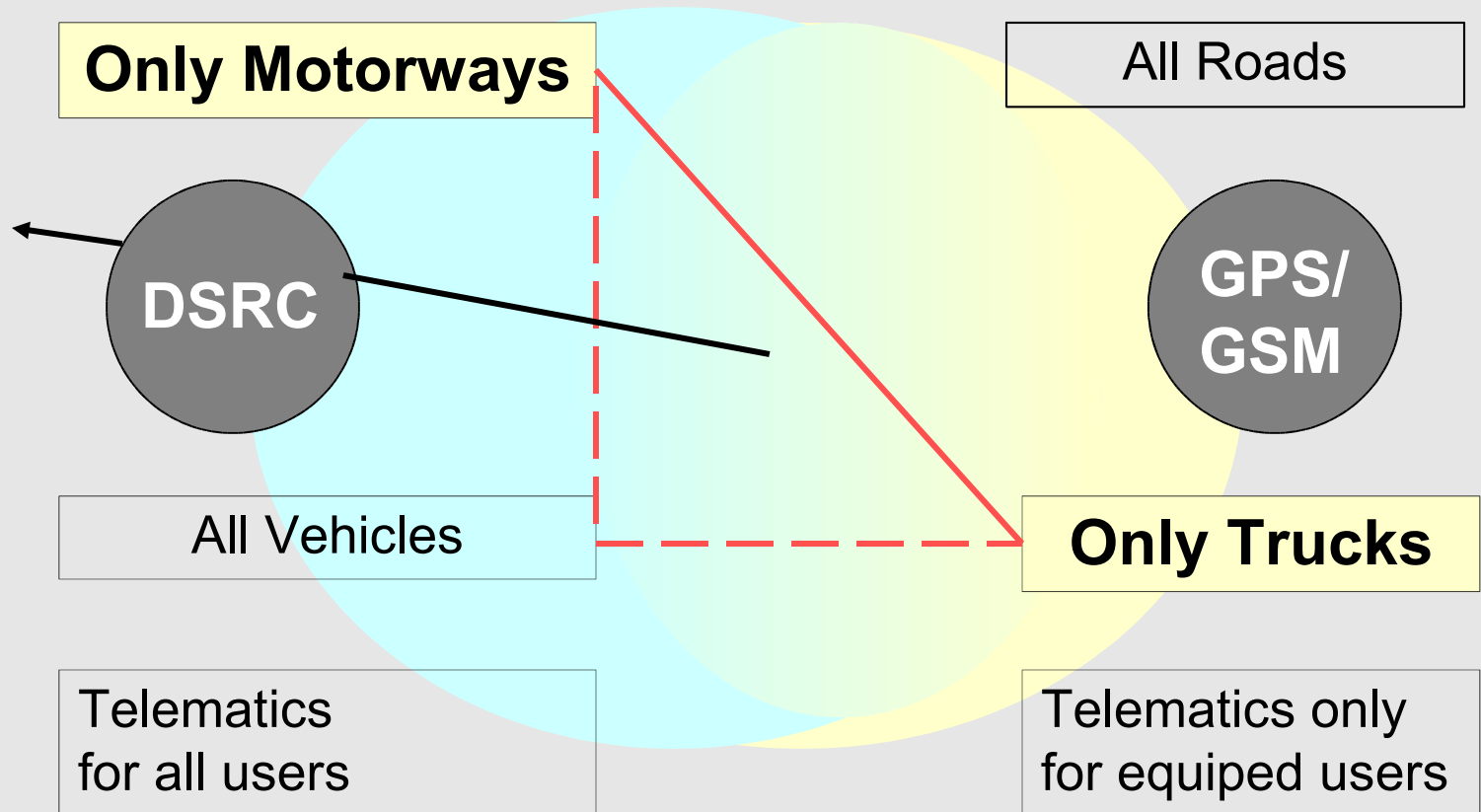


Technical decision Fundamental

Austria:

Only motorways but only with vehicle > 3,5 t max permissible weight:

- trucks
- busses
- mobile homes



Advantages of the possible technologies

DSRC-System

- User friendly -> No installation / Easy handling / low price
- High level of transparency-> System in hands of operator
- Easily expandable to other user groups (passenger cars)
- Road infrastructure usable – for checks (traffic safety) or as information for equipped or non-equipped vehicles
- No second system required, as the obligatory OBU for vehicles are easily assesible and their provision is non-discriminatory

GPS/GSM-System

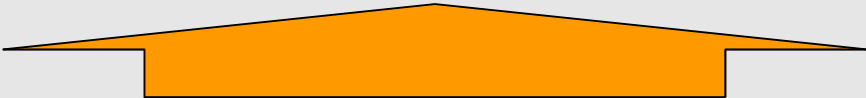

- Only small constructional investments required
- OBU can store/process/analyse many data
- The European satellite system Galileo can be used in the long term
- Easily expandable to other roads and regions
- Information can be trasferred selectively to the user of the OBU → this service can be charged separately

Assessment of technologies:

- Both technologies are feasible for the Austrian highway network
- Assessment by price and quality parameters
 - Price: Overall Cost for construction and 10 years of operation
 - Quality: Fulfilment of additional requirements
- Pros and Cons of both systems equalised each other

Operation Model

Best offer evaluation (1)

<p>Costs maximal 70 points</p>	<p>Quality maximal 30 points</p>
 <p>Smallest amount for investment and the costs of 10 years of operation</p>	 <p>Fullfillment of the target criterias</p>

Operation Model

Best offer evaluation (2)

	A-WAY	RSA* Offer 1	RSA* Offer 2	AUTOSTRAD
POINTS - Factor Price
POINTS- Factor Quality
	87,51	84,10	86,02	90,86
	2	4	3	1

*) RSA = Road Services Austria

Operation Model

Contracting with an operator

- Operating time: 10 years, Extension of a period: max. 5 years
- Technology: DSRC MW 5,8 GHz according CEN TC 278
- Tasks of the operator
 - Planning and financing
 - Installation
 - Operation
- Requirements of the contracting body
 - User-friendliness
 - Availability of GO-boxes
 - Free Flow Multilane...



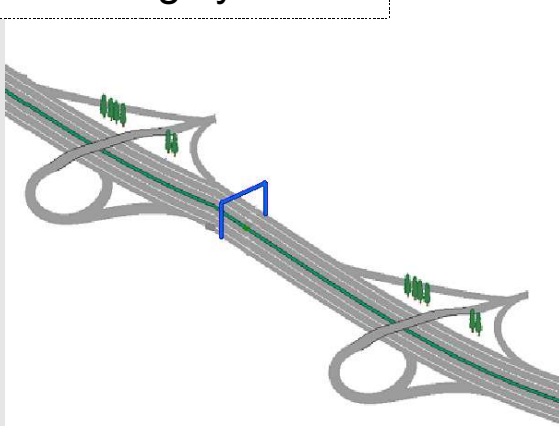
- Brand for the tolling system:



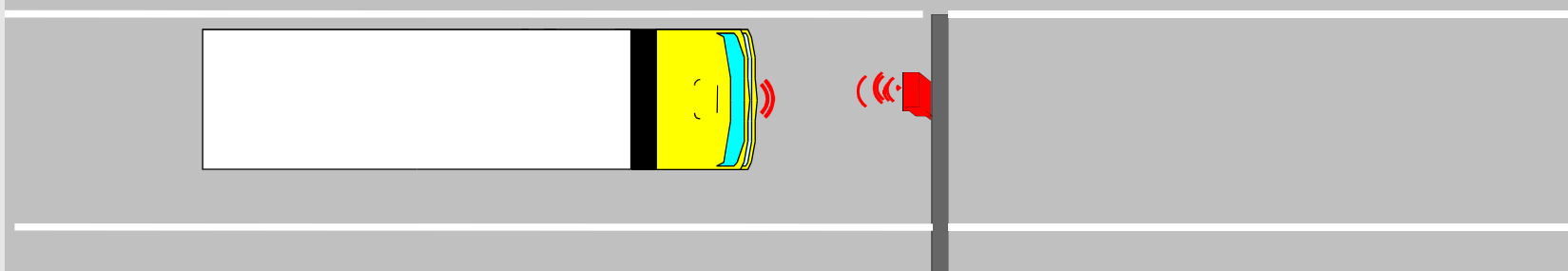
MAUTSYSTEM FÜR LKW UND BUS

Components of the tolling system: Road side infrastructure

Open tolling system



Free flow multilane system



- **Tolling system – visible components: Tolling gantries and GO-Box**

Components of the tolling system



Tolling Gantries

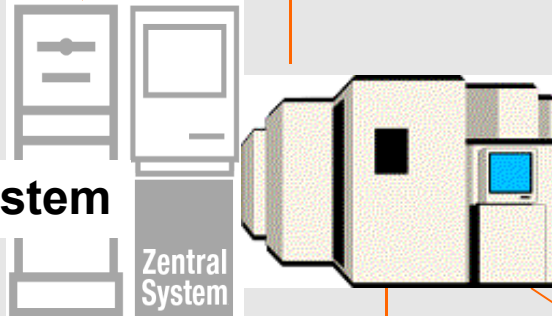
Call Center



GO-Box



Central System

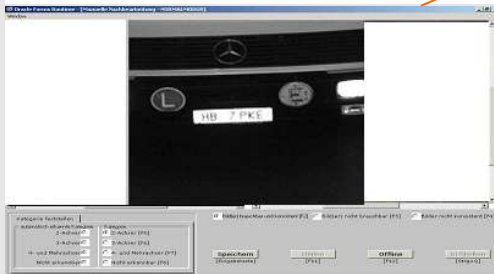


Zentral System

Points of Sale



Enforcement Center



Enforcement Gantries



Mobile Enforcement

Components of the tolling system:

GO-BOX



- Mandatory on-board unit
- Handling fee per GO-Box: € 5 (incl. VAT)
- Can be set for 3 different vehicles categories (number of axles: 2, 3, 4+)
- GO-Box is personalised, i.e. registered for a specific license plate, basic vehicle category, payment means
- Based on 5.8 GHz DSRC



- Post-pay or Pre-pay possible

Components of the tolling system:

Sales network

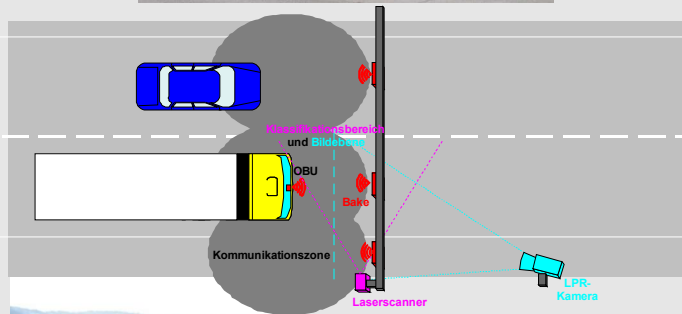
- Approx. 220 points of sale
- Non-discriminatory system access
- Staffed points of sale and vending machines
- Within Austria and on the access roads in the neighbouring countries
- At petrol stations, motorway services, forwarding agencies, service centres
- Purchase, return of GO-Box, checking of the last 30 transactions, loading prepay, back payment
- Regular training and follow-up training of POS staff



Components of the tolling system: Enforcement



- 100 fixed enforcement gantries



20 portable enforcement devices



130 enforcement officers

30 vehicles

Basic figures of the tolling system:

Construction

Number of tolling sections	About 800
Concrete used for tolling stations	About 10.000 m³
Steel used for gantry construction	About 3.000 t
Number of microwave-beacons	About 2.500
Number of vehicle-km subject to toll	About 3.250 Mio. km / year
Number of trips subject to toll	About 50 Mio. / year

Basic figures of the tolling system:

- Reliable charging (< 0,1% incomplete transactions) also in case of heavy winter conditions
- Avg. 1,8 Mio daily toll transactions (Peak: more than 2 Mio.)
- Mainly post payment used
- 130 toll inspectors
- Less than 2 % toll evaders
- Very high user acceptance without major problems for the user
- No major problems for the operator
- About 3000 user contracts with Swiss OBU
(first world wide interoperability between 2 countries)

Further Goals:

- Improve the comfort for the user
 - (eg. Clearing of missed transaction, presentation of the invoice)
- Establishing new features (on demand of user or politics)
- Establishing interoperability with the Italian Telepass System
- Establishing interoperability with the new Slovenian ABC System
- Establishing Interoperability with the new French TIS System

Facts and Figures

1st January – 31th August 04

Transactions	> 400 Mio.
Turnover	> 480 Mio. €
GO-Boxes distributed	ca. 400.000

Conclusion:

- The system fits the demand of the user and the operator / patron
- The system can be operated by the client (truck driver)
- The system works without major problem
- The system could be installed very quick (18 month)

Thank you very much for your attention

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