



Design: www.asecapdays.com - Spain | Madrid 2016

## 44<sup>TH</sup> ASECAP STUDY & INFORMATION DAYS 2016

# The Path Towards an Integrated And Sustainable Mobility in Europe

Intercontinental Hotel  
23-25 May 2016

[www.asecapdays.com](http://www.asecapdays.com)



Organized by



# The Czech ETS, its development and positive effects to road safety



ASECAP Days, Madrid 2016

Karel Feix, CEO Kapsch CZ

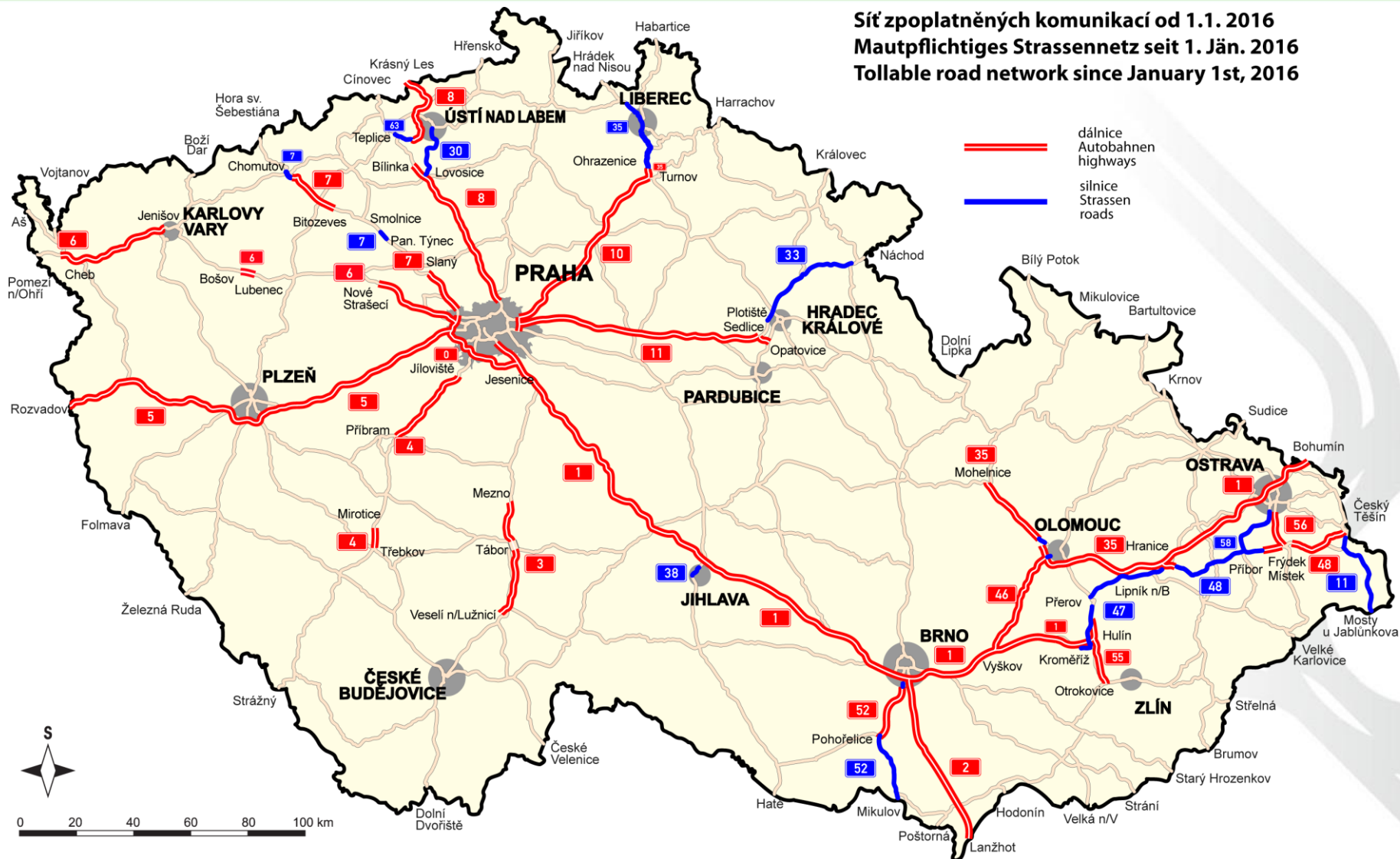


# Current status of the toll system in CZ.

- **A successful state IT project** = one invested crown earns four more, generating 5x more revenue than time-based highway coupons.
- The toll system has already collected **2,77 bill. EUR for the state** – by the end of the first decade of the cycle, it will add another 250 mio EUR. The state paid **3.4 billion CZK (exc. VAT) = 136 mio EUR to build the toll system.**
- In past years, the operator **refurbished and modernized the system** so that after 2016 he will be prepared to collect in subsequent years.
- **Toll tariffs were raised** and new discounted Euro VI emission categories were implemented = **the environmental effect take part.**
- **High toll efficiency** – total performance of the Czech electronic toll collection system exceeds **99.6 %.**
- The Czech government **decided to prolonge the operation of the current DSRC toll system** = reliability, modernity, cost-effectiveness.

# Map of tolled roads in CZ.

**Sít' zpoplatněných komunikací od 1.1. 2016**  
**Mautpflichtiges Strassennetz seit 1. Jan. 2016**  
**Tollable road network since January 1st, 2016**



# Economic characteristics the CZ ETS.

- **This is one of only a few successful state IT investments** - of one invested crown it brings in a further five, it generates four times more money than the former motorway time coupons.
- **Quick return on investment** – in 7 months (!) of operation total toll revenues have reached the same sums as its construction costs.
- **Budget neutrality** – a toll project without demands on the state budget = the state asserted a contract with the contractor that it would gradually repay the costs of delivery of the toll system within 4 years as of the start of the tender (once it acquired money from the toll).
- **Risk-free “quasiPPP” financing** – a successful project of cooperation of the private and public sector when the contractor financed, implemented and bore all the risks.
- **High guarantees and warranties** – the contractor and operator guarantees under high sanctions full functionality and efficiency of the toll system.

# Quantity discounts on toll charges.

- As compensation to transport operators for the double increase in toll tariffs, **starting in 2012** the state decided to introduce **discounts for trucks** that travel a large number of tolled kilometres and pay the relevant amount in toll charges.
- This is conditional on an active application and the more detailed registration of every vehicle and operator. 2/3 of applicants for discounts are Czech entities.
- Since 2013 the state has paid transport operators approx. 150 million CZK (5.6 million EUR) in discounts every year, and over 200 million crowns (7.4 million EUR) for last year.

Amount paid in toll during the year	Toll discount provided
<b>2,800 EUR</b>	<b>5 %</b>
<b>4,000 EUR</b>	<b>8 %</b>
<b>7,000 EUR</b>	<b>11 %</b>
<b>11,000 EUR</b>	<b>13 %</b>

Note: Rules valid for year 2015. Source: Ministry of Transport of the Czech Republic

# EETS implementation.

***EU regulation binds states to quickly introduce EETS (European Electronic Toll Services):***

- EETS introduces in practice interoperability regardless of the applied technology = **1 onboard unit and 1 contract for the truck to travel throughout Europe = the boundary mark separating provided toll services from technical operations**
- In the Czech Republic EETS **is recognised by the law, but implementation is delayed** (the dates are under the sanctions and control of EU bodies)
- for example in Italy, Spain, Scandinavia, Austria and Poland EETS are already being implemented

1<sup>st</sup> advantage: opening of the market to EETS contractors,  
incl. onboard units of various contractors

2<sup>nd</sup> advantage: the state will increase the value of its asset



**In these day the State initiated steps toward to implementation of EETS in 2017**

# EETS in the Czech Republic.

- In the Czech Republic EETS **is recognised by the Act No 13/1997** on roads, **but implementation is delayed**
- The Czech Republic is facing the restored European Commission infringement proceedings concerning non-implementation of the regulation on EETS
- On [www.mdcr.cz](http://www.mdcr.cz): Declaration on the Electronic Toll System - **Overview of the EETS domain in the Czech Republic** including:

Contract on the provision of EETS

Toll road network

List of Tariffs of the Road and Motorway Directorate

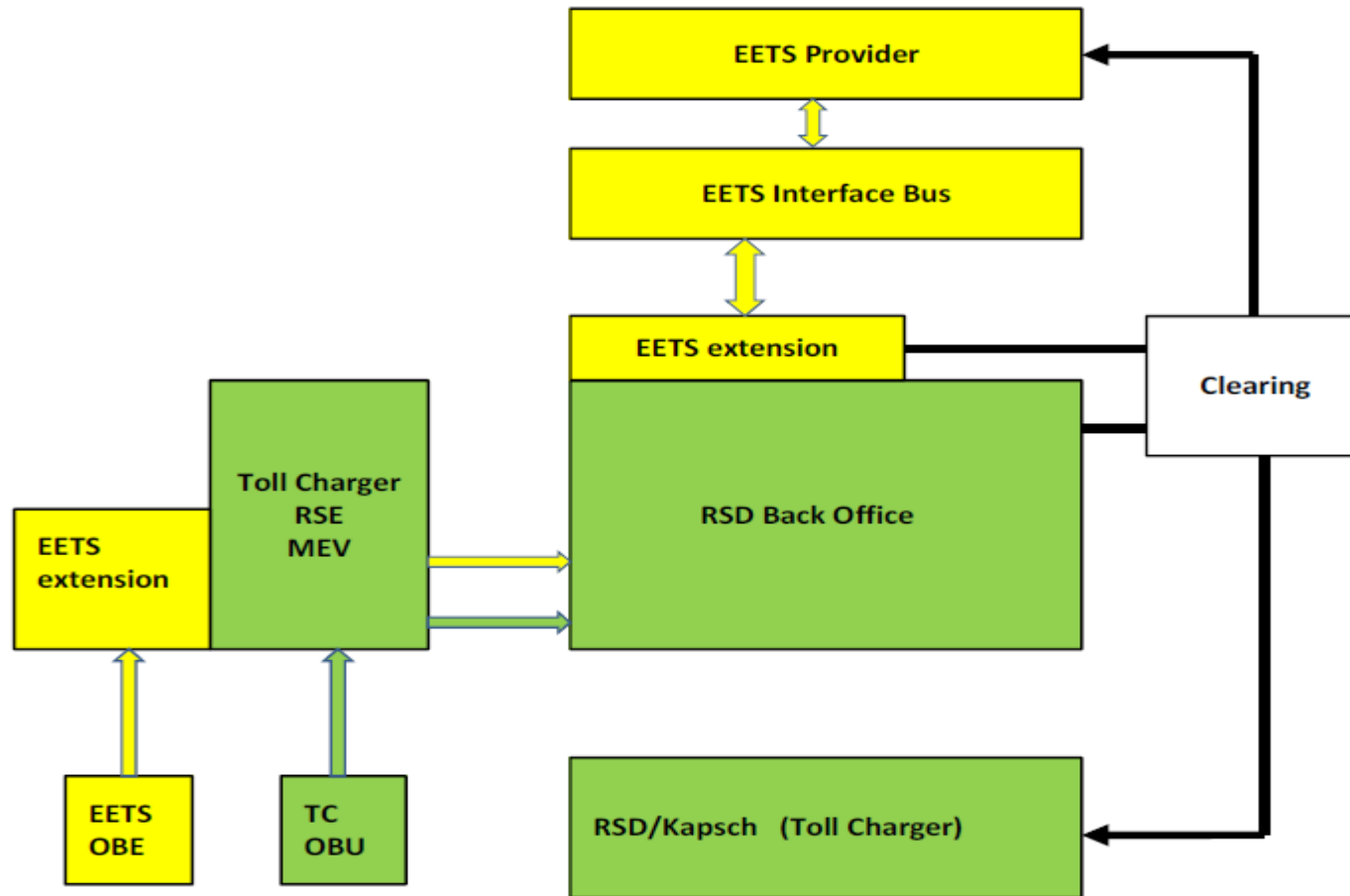
Parameters of Mutual Communications

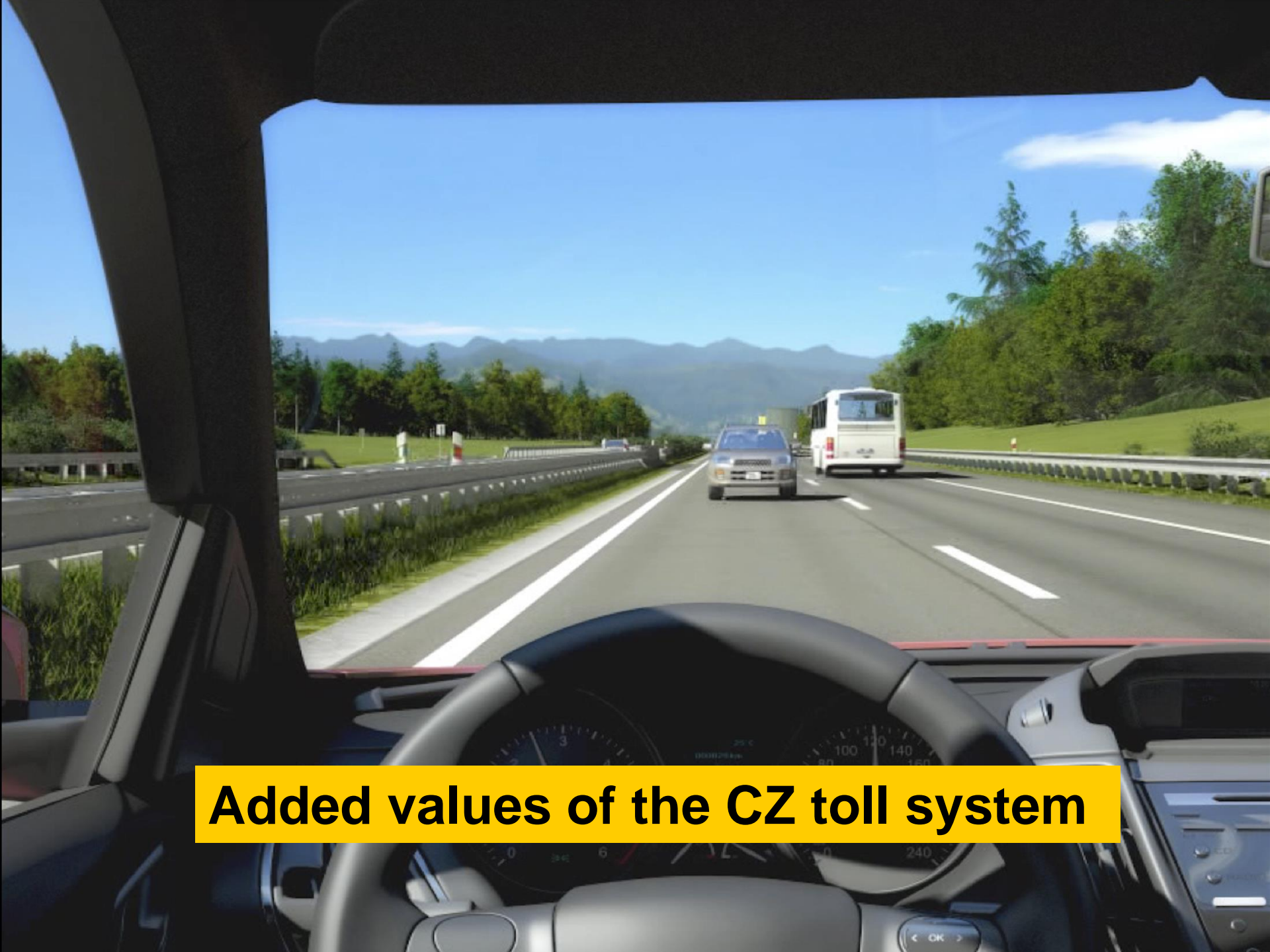
Contractual Penalties

Registers



# EETS in the Czech Republic.





**Added values of the CZ toll system**



# Safety, environment & road management

**Multifunctional infrastructure** – a fully invested national toll infrastructure allows the state to reuse the already implemented investment several times to develop telematic applications (for traffic safety, increased comfort of motorists, statistics and data):

- an important **online data source** and information for the NDIC + serves the RMD when planning closures for the modernisation of the D1
- supplemented by a telematic function it serves to **manage traffic** and increase traffic safety (traffic-information system)
- **informs of arrival times** for selected destinations
- detects **wrong-way vehicles on motorways**
- the control gates can be used as **weighing points**, in the first stage mainly at **border crossings** (pilot in progress).
- motivated hauliers to quicker **change of vehicle fleets for more environmental trucks** with emission class Euro V.



# Environmental impact of the CZ ETS.

- Since 2011 the state has used the toll system to implement both environmental and fiscal policy = reduction in harmful emissions from trucks.
- Following a dual increase in km tariffs (2011 and 2012), the lowest rates apply to vehicle emission class Euro V. Since January 2015 a special rate has applied to emission class Euro VI+EEV.
- The state has always recorded immediate, rapid growth in the proportion of the most ecological vehicles to the total collected toll and associated toll reduction = **e.g. share of vehicles with Euro VI on collected toll (in last 12 months) increased from 0 to 30 %.**

Decrease in harmful emissions from trucks in CZ	Comparison of 01/2011 (start of EuroV favouritism) and 01/2015
CO - carbon monoxide	- 21 %
HC - hydrocarbons	- 28 %
NO – nitrogen oxides	- 40 %

Note: with the increase in toll transactions by 15%

# The section speed enforcement = drivers/workers safety.

- Currently there is ongoing six-year modernization of main road D1, gradually in several stages. This brings bottleneck of highway and speed reduction of vehicles.
- Ignoring reduction of speed leads to an increased number of traffic accidents (with the associated traffic jams) and endangering the lives of Highway Administration workers.



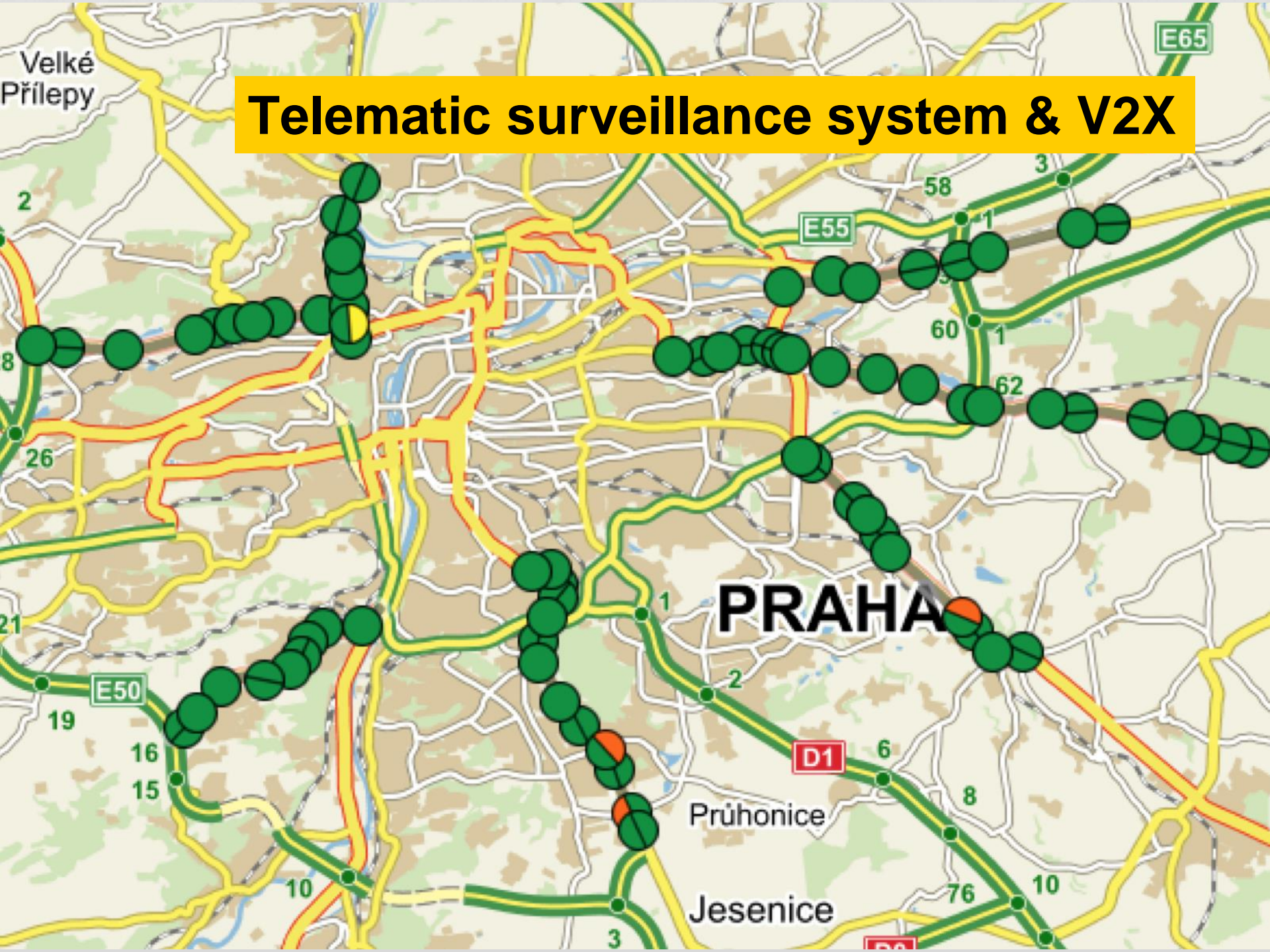
**The state decided to repaired sections install on the toll gates the segment speed measurement = automatic fining of drivers is a leading form of prevention and deterrence to respect the speed limit.**



# Wrong Way Detection System = drivers safety.

- The new aspect of the toll infrastructure in the Czech Republic is that it serves **to promptly detect vehicles travelling the wrong way** on highways and motorways, **starting January 2012**.
- So far the Czech toll system has been equipped **on highways D1, D5 and D2 with IDS technology** which by using sensors immediately detects dangerous vehicles travelling the wrong way.
- Warning reports are sent to **the National Traffic Information Centre** from where they are displayed on **highways information signs**, on **the radio** and smart **navigation systems**, and the Integrated Rescue System and police is also informed.
- Each month in a single highway detected about **six vehicles driving in the opposite direction**.
- **Economical consequences:** beyond the protection of human life system brings savings to state and society from the reduction of traffic accidents - both involved in service and road infrastructure, estimated savings may reach on one highway in direct damage up to 2 mio EUR/per year.

# Telematic surveillance system & V2X



# Telematic surveillance system (TSS) for Prague.

▪ Project of the capital Prague to complement the collection of traffic information for traffic management. Project management is provided by Technická správa komunikací Praha (Technical Management of Roads in Prague). Supplier of the project is Kapsch with Camea, Vars Brno and Eltodo.

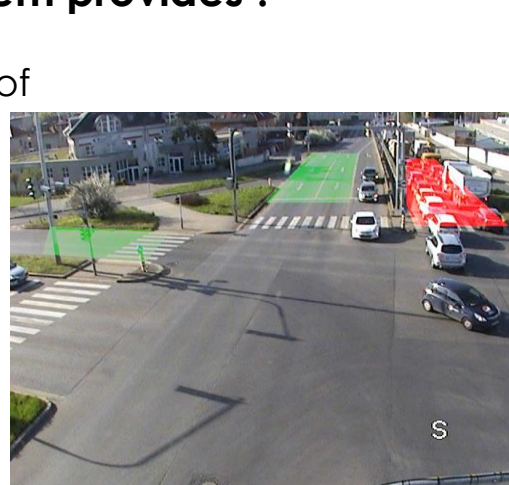
## ▪ Extension of HDRÚ (Main Transport Control Switchboard):

- specialized computer software to provide a sophisticated, the most accurate and reliable calculation of the levels of operation based on modern computational methods,
- a data analyzer for performing classification of the validity of the measured data based on the status information from the measuring device, historical measured values and logical rules,
- application for user configuration of scenarios and trigger conditions, which allows the user (administrator) to create and edit scenarios for traffic control and trigger conditions

## ▪ Traffic-telematics camera surveillance system provides :

- Operator supervision of all locations
- Detection of events - incidents (detection of traffic jam detection of stationary vehicle, detection of roadblocks of crossroads)
- vehicles count
- vehicle classification into 3 classes (cars, trucks, NA)
- speed traffic flow
- traffic line calculation of travel time.

## ▪ TSS was integrated to HDRÚ Prague.





# ITS co-operative system – V2X in Prague

- Kapsch delivered the subsystem to HDŘÚ for cooperative communication system of vehicles to vehicles and to infrastructure.

- It is an additional source of traffic data received directly from the operation and their distribution back to drivers according to their position. Traffic data are processed in the main control panel and sent to the RSU (Road Side Units) according to their position.

- **Data obtained from the vehicles unit sends to HDŘÚ for processing:**

Data from vehicles = eg. their position, acceleration/deceleration speed, direction of travel, type of vehicle ...



- **Traffic data from HDŘÚ are transmitted to passing vehicles equipped by V2X unit:**

- Traffic data from HDŘÚ eg. information on accidents, traffic jams, roads repairs and other traffic restrictions, driving time between RSU, information on ZPI, meteorological situation, diversionary routes ...

- Traffic data are filtered according to the geographic position of RSU units. Traffic data from HDŘÚ are selected for RSU according to their locations.

