

# Digital and Innovative Control Systems for Transport Authorities



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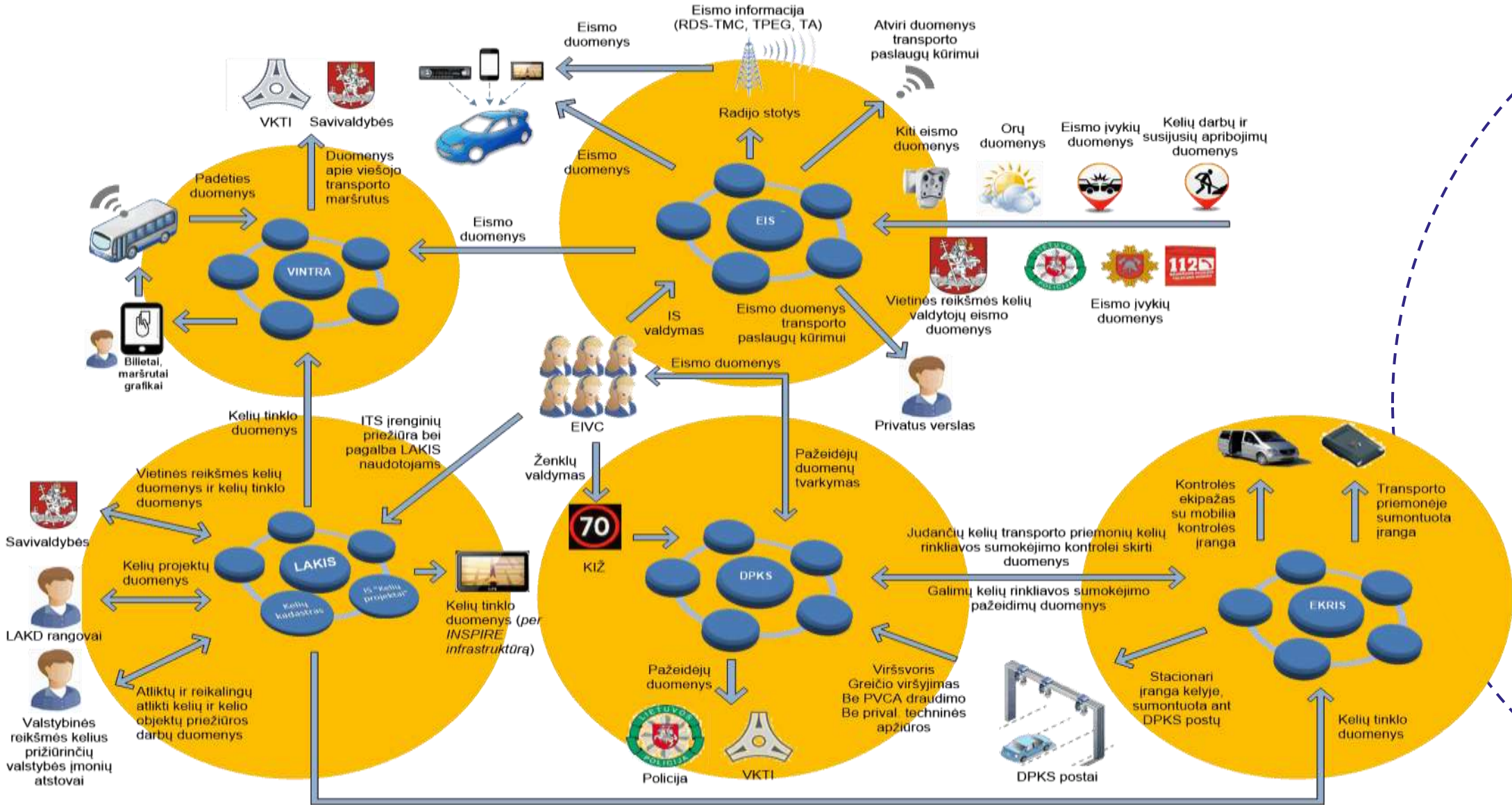
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# 5 cases of innovative and digital control

5 CASES	
Multifunctional vehicle control & smart enforcement systems	Speed control smart enforcement systems
Control based on smart tachograph data	Road Permits Control and Enforcement
Vignette / Toll Control Systems	

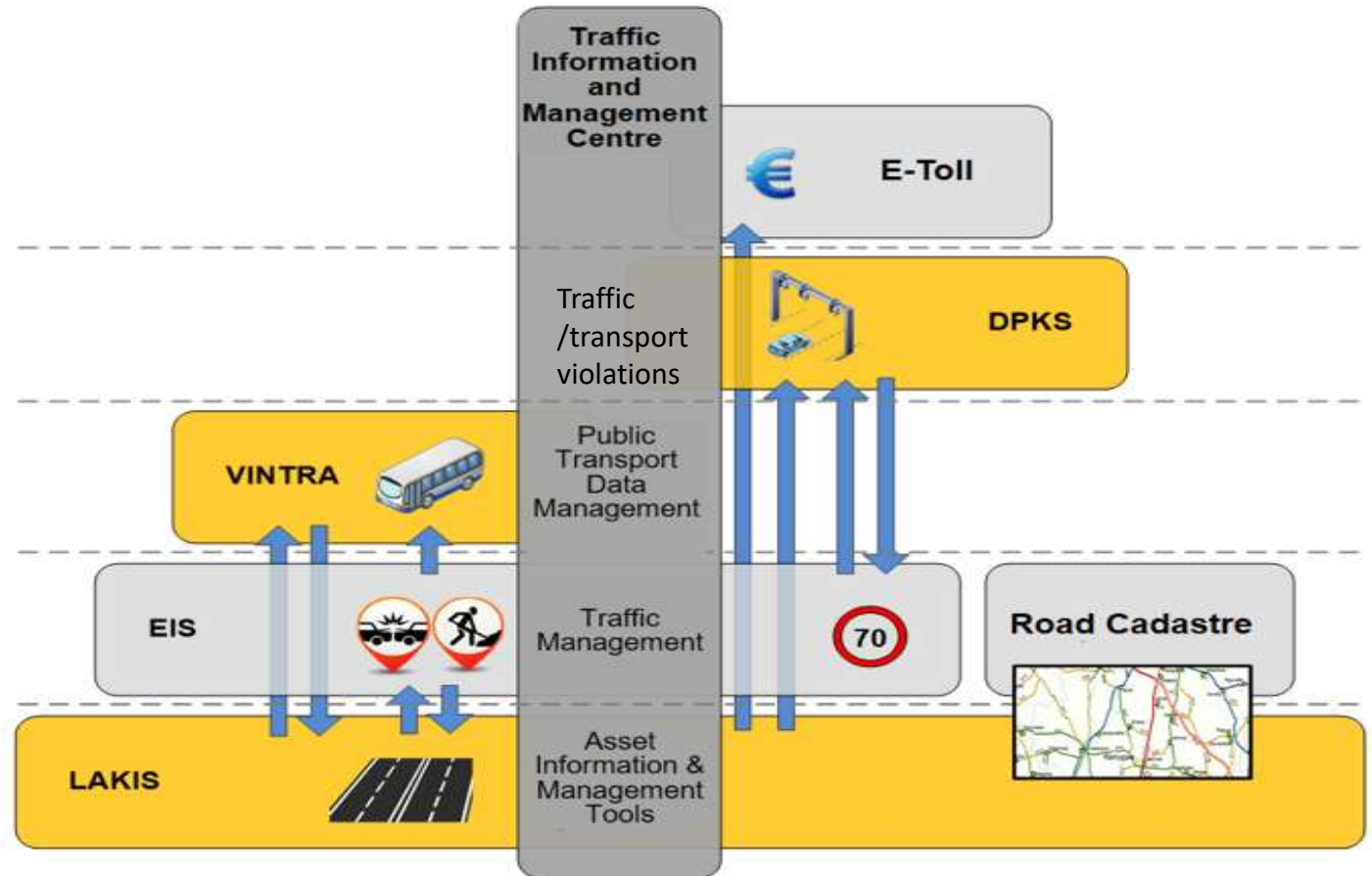
# Integration between transport systems in Lithuania



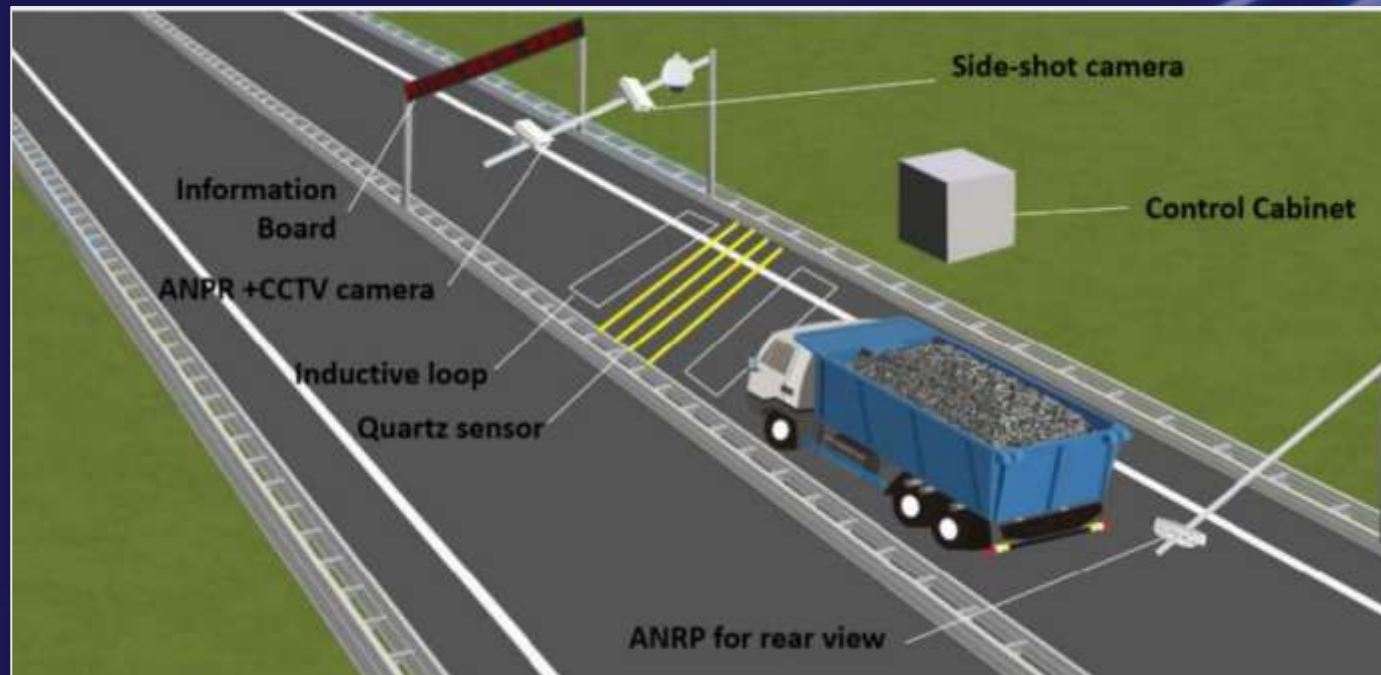
# Digital control and smart enforcement structure in Lithuania

The Lithuanian smart enforcement system is applied to:

- Insurance control;
- Periodic technical inspection;
- Road tolling;
- Speed and average speed;
- Overweight;
- Dimensions;
- Legal use of vehicles;
- Etc.



# Multifunctional vehicle control & smart enforcement systems



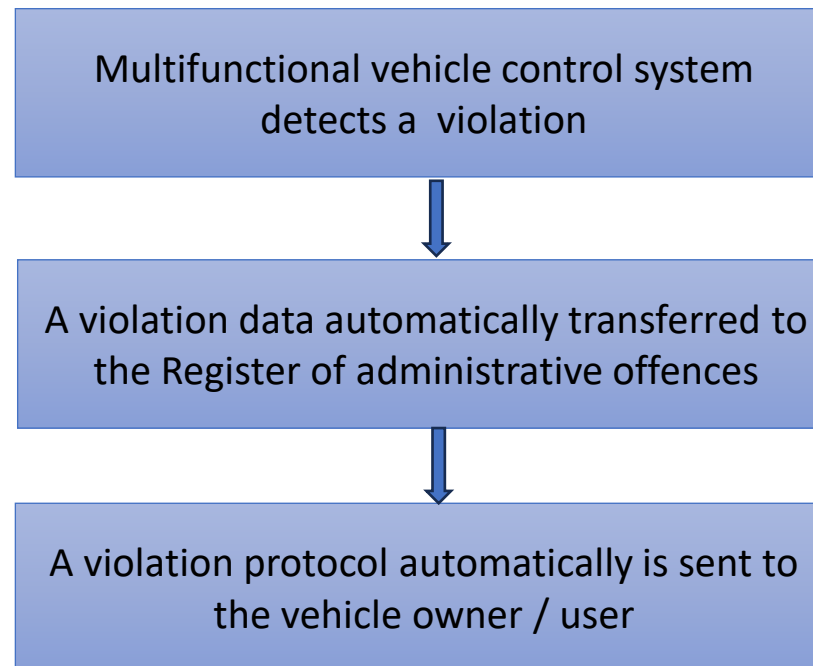
# Multifunctional vehicle control system



- Multifunctional vehicle control system contains many devices as cameras, sensors (quartz sensors), induction loops, etc.
- **This system usually can detect:**
  - Vehicle weight, exceeding axle load** (weigh-in-motion);
  - Oversized vehicles** driving on the roads without a permit;
  - Vehicles **without a valid technical inspection**;
  - Vehicles **not covered by civil liability insurance**;
  - Vehicles **without a valid road vignette**;
  - Vehicles **without a valid transport permit** (a bilateral / CEMT);
  - Vehicles **wanted by the police, state border guard, customs services**;
  - A vehicle speed**;
  - Traffic intensity**;
  - Etc.

# and connected to smart enforcement system

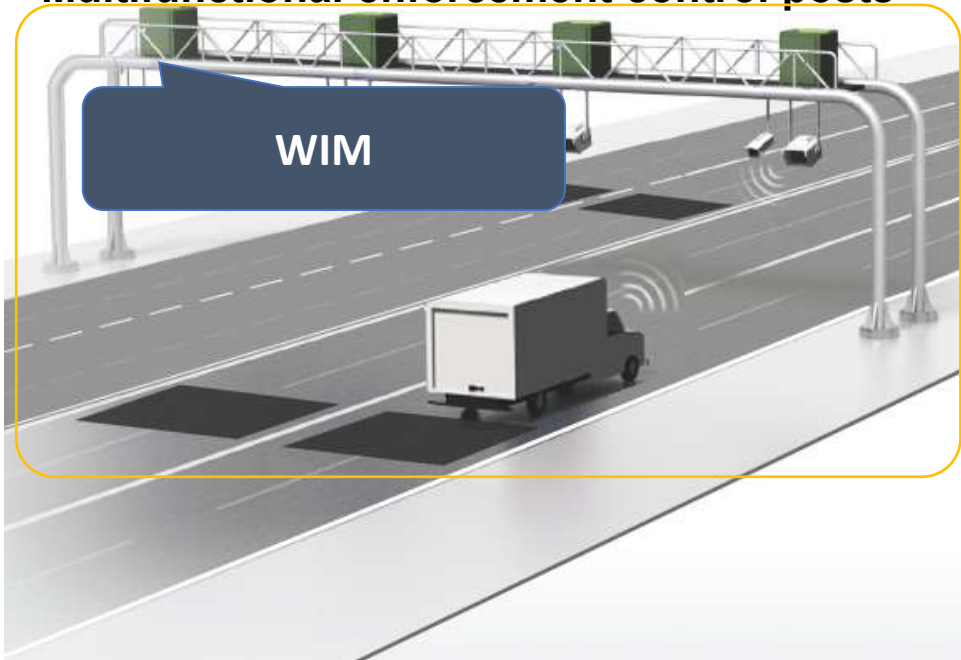
- **All collected data is integrated into the traffic control system and many other public systems** (for example, the Register of suspects and convicted persons, the Register of wanted persons, the Register of road vehicle drivers...)
- **Violation data is connected to the smart enforcement system** (LT case – the Register of administrative offences)
- Can the system be connected to customs enforcement systems?



# Multifunctional vehicle control and enforcement system



Multifunctional enforcement control posts



Average speed cameras



Traffic Information and Control Centre



EIS

DPKS

# Key challenges ahead

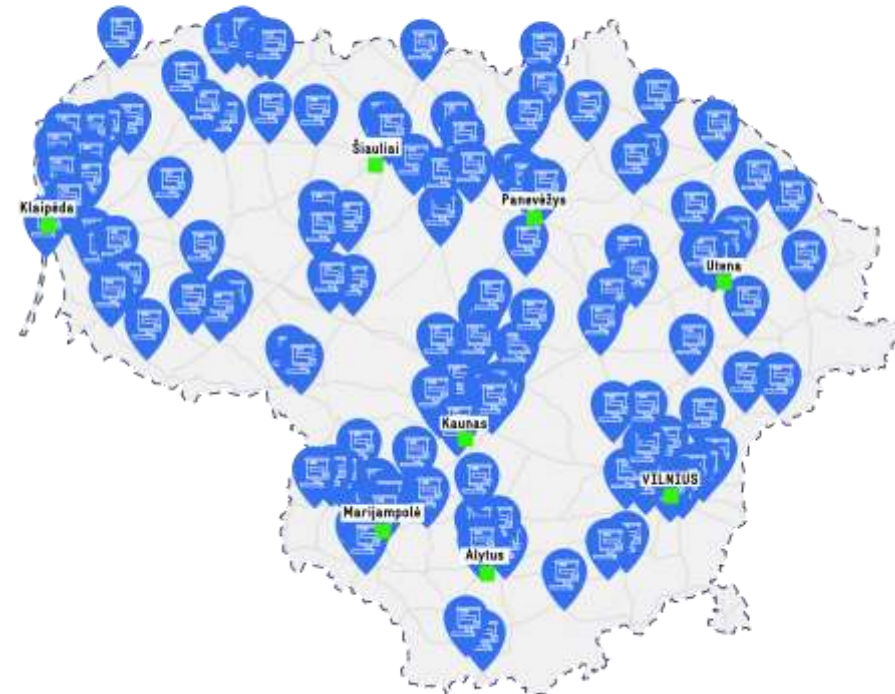
- The weigh-in-motion system still requires regular calibration and metrological inspections
- It is difficult to identify the owner or driver of a vehicle from a third country, as a country enforcement system is not connected with those enforcement systems of third countries
- It might occur a case when the vehicle owner refuses to accept the fine, claiming that someone else was driving at the time of the violation (in such cases, manual procedures are applied)

# Speed control smart enforcement systems



# Speed control systems: case of Lithuania

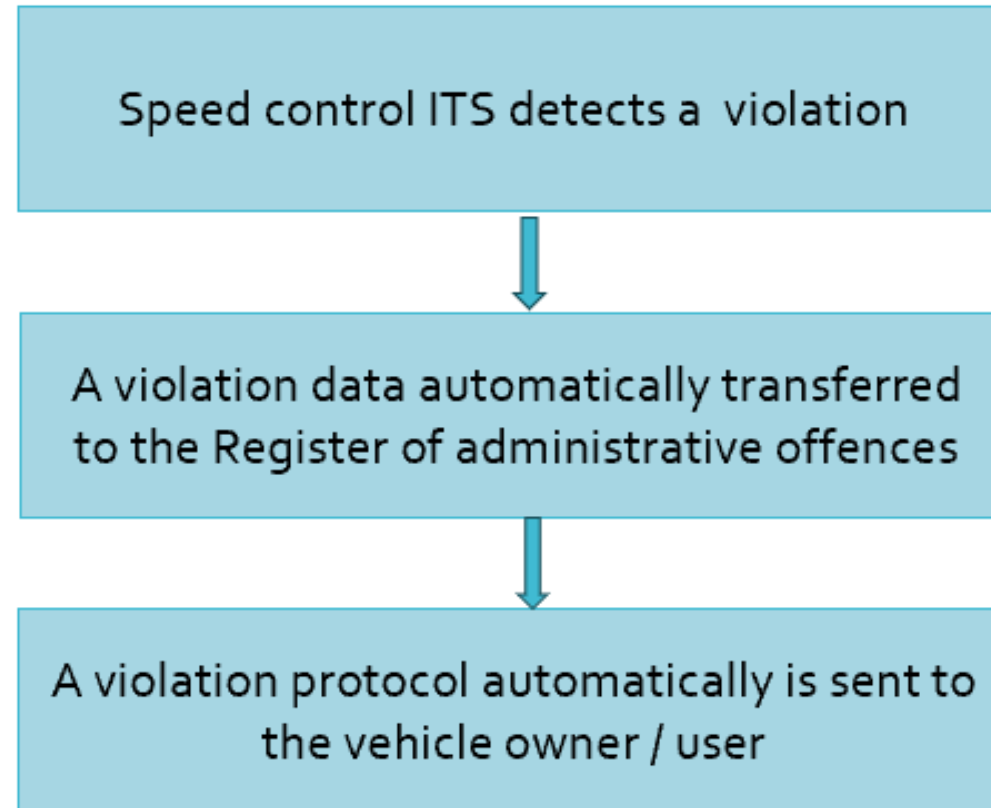
- Status quo: Lithuanian national road network currently has **212 units of stationary speed control cameras**, consisting of:
  - ❑ **134 units of average speed control cameras**
  - ❑ **78 units of fixed speed control cameras**



# Speed control smart enforcement system: case of Lithuania

- **Legislative framework:** The Law on Road Safety on Automobile Roads and the Code of Administrative Offenses allow the use of stationary speed control and automated enforcement of speed violations
- **Financial set-up:** The maintenance, operation, and development of stationary speed enforcement systems are funded from the fines collected for speed violations, under the shared responsibility of JSC “Via Lietuva” (the Lithuanian Road Directory) and the Lithuanian Police Department
- **System integrations:** All speed violation data is integrated into the enforcement system – the Register of administrative offences
- **Automatization:** A violation protocol automatically is sent to the vehicle owner / user

# Speed control smart enforcement system: case of Lithuania



# Control based on smart tachograph data



# Smart tachograph (version 2)

- Under Regulation No 561/2006, **from 19 August 2025**, all heavy-duty vehicles registered in the EU must be fitted with **a smart tachograph (version 2)**
- **Key features of smart tachograph (version 2):**
  - ❑ Automatic border crossing detection;
  - ❑ Automatic loading/unloading recording;
  - ❑ GNSS signal authentication;
  - ❑ Improved and more secure Dedicated short-range communication (DSRC);
  - ❑ Increased data storage (for 56 days);
  - ❑ GIS data integration – automatically records the precise location of events (such as border crossings).

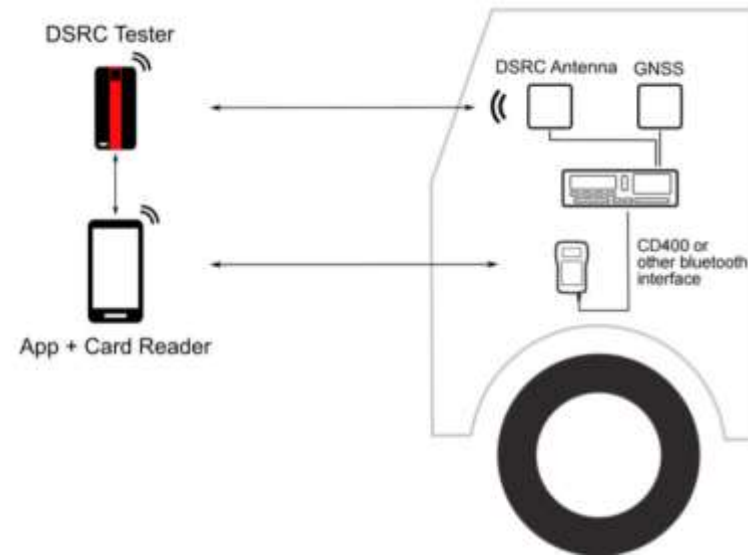
# Control based on smart tachograph data

- By using DSRC technology, transport authorities in the EU Member States **can now remotely access the most important parameters from smart tachographs;**
- Transport authorities can download **up to 25 remote tachograph monitoring (RTM) messages** (as truck identification, driver activity and events, driving time compliance, etc. )

RTMs communicated by the DSRC in Smart Tachographs		
Version 1		
RTM 1	Vehicle Registration Plate	String of characters
RTM 2	Speeding event	TRUE / FALSE
RTM 3	Driving without valid card	TRUE / FALSE
RTM 4	Valid driver card	TRUE / FALSE
RTM 5	Card insertion while driving	TRUE / FALSE
RTM 6	Motion data error	TRUE / FALSE
RTM 7	Vehicle motion conflict	TRUE / FALSE
RTM 8	2nd driver card	TRUE / FALSE
RTM 9	Current activity	TRUE / FALSE
RTM 10	Last session closed	TRUE / FALSE
RTM 11	Power supply interruption	Number of the recorded power supply interruption events within the last 10 days
RTM 12	Sensor fault	Sensor fault one octet as per data dictionary
RTM 13	Time adjustment	Value of the most recent time adjustment
RTM 14	Security breach attempt	Beginning time of the latest stored security breach attempt event.
RTM 15	Last calibration	Value of the most recent calibration record
RTM 16	Previous calibration	Value of the calibration record preceding the most recent calibration record.
RTM 17	Date tachograph connected	Date of first calibration of the VU in the current vehicle
RTM 18	Current speed	Last current recorded speed in km/h.
RTM 19	Timestamp	Date and time
Version 2		
RTM 20	Time at which the latest authenticated vehicle position was available	Date and time
RTM 21	Continuous driving time	Time value
RTM 22	Longest daily driving time for the ongoing and previous RTM-shift, calculated in accordance with the Addendum to Appendix 14	Time value
RTM 23	Longest daily driving time within the ongoing week, calculated in accordance with the Addendum to Appendix 14	Time value
RTM 24	Weekly driving time, calculated in accordance with the Addendum in Appendix 14	Time value
RTM 25	Fortnightly driving time, calculated in accordance with the addendum in Appendix 14	Time value

# Control based on smart tachograph data

- For now, transport authorities, by receiving remote data from smart tachographs, **can evaluate possible rule violations;**
- In such a case, the **vehicle is stopped for inspection, during which the full tachograph data is downloaded to confirm a rule violation** (for example, driving too long);



# Road permits control and enforcement



# Control on road permits

- Hundreds of trucks from the 3rd countries every day enter and leave the territory of foreign country. All of these trucks are **required to have a correctly filled and valid bilateral or other type permit for cargo transport operations**. It is impossible to stop all of them and check whether the drivers have a valid road permit.

The image shows a Lithuanian road permit form titled "LEIDIMAS" (Permit) for cargo transport. The form is issued by the Ministry of Transport and Communications of the Republic of Lithuania. A red box highlights a section of the form, and several purple checkmarks are visible on the right side, indicating that certain conditions have been met.



# Control on road permits

- Since permits are still not digital in most cases, it is difficult to ensure transparent control. If a country has border control, **Customs can check 100% of permit usage at border crossing points** (as is the case in Lithuania on the external borders with Belarus).
- In such cases, Customs authorities **should have full powers to conduct inspections and impose penalties.**
- In the absence of border control (as in the Schengen area), it becomes challenging to monitor and enforce compliance with road permit requirements.
- There is no capacity to physically stop and check all third-country trucks on the road for permits usage.

# Control on road permits: Lithuania case

- Lithuania introduces a **vignette-based permit control system**, which is still operating in test mode.
- When a driver from a third country purchases a vignette, the system now also requires the entry of the bilateral road permit number, as well as the loading and unloading locations.
- By having this information in the road traffic control system, transport inspectors, police or customs **will be able remotely verify whether the road permit is being used correctly**.

# Control on road permits: Lithuania case

LIETUVOS AUTOMOBILIŲ KELIŲ DIREKCIJA

LI EN RU

Pirkti vinjetę Tikrinti vinjetę Pardavimo vietas Tarifai Mokami keliai

Vinječių pirkimas > Vinjetė

Inkorporuojami trys papildomi laukai kelionės leidimų par

Registracijos valstybė: \* Rusija

Valstybinis numeris: \* 000TTo39

Kategorija: N3

Lengvata: Be lengvatų

Taršos lygis: Euro V

Trukmė: Diena

Vinjetės variantas: \* B - Diena - 11.00

Galioti nuo dabar:

Atgal Išsaugoti

Krovinio pakrovimo vieta: \* Rusija

Krovinio iškrovimo vieta: \* Lietuva

\*jei važiuoja ne krovinio, šį lauką pildyti nereikia tai pačy.

Kelionės leidimo numeris: \* 1234567

# Vignette and toll control systems



# Vignette / road toll control systems

## Different road fee collection and control systems:

- 1) Vignette system
- 2) Toll system based on gate infrastructure
- 3) E-toll system based on GPS tracking

# Vignette control and enforcement: Lithuania case

Camera verifies vignette usage



 VĮ LIETUVOS  
AUTOMOBILIŲ  
KELIŲ DIREKCIJA

In a violation case, data goes to the register of administrative offences



 **ird** Informatikos ir ryšių  
departamentas  
prie Lietuvos Respublikos  
vidaus reikalų ministerijos

Protocols automatically or manually sent to users



 **LTSA** Lietuvos  
transporto saugos  
administracija



 Lietuvos  
transporto saugos  
administracija





Foreign users are checked by customs at border crossing points



 TRANSPORT  
INNOVATION  
ASSOCIATION

# Public open register / system for verifying vignette usage

Via Lietuva

Buy vignette **Verify vignette** Points of sale Toll rates Toll roads F.A.Q Submit request

BEWARE OF FRAUDSTERS! Via Lithuania informs about received SMS messages regarding vignettes with a malicious link. DO NOT CLICK ANYTHING! Via messages! Please report such messages at <https://www.nksc.lt/pranesti.html>

VIGNETTE VALIDITY CHECK

Registration country of vehicle:  
Lithuania

Registration number of vehicle:

Verify

Via Lietuva

Information center +370 5 232 9600 Login

Buy vignette Verify vignette Points of sale Toll rates Toll roads F.A.Q Submit request

EN EN RU

VIGNETTE VALIDITY CHECK

Registration country of vehicle:  
Turkey

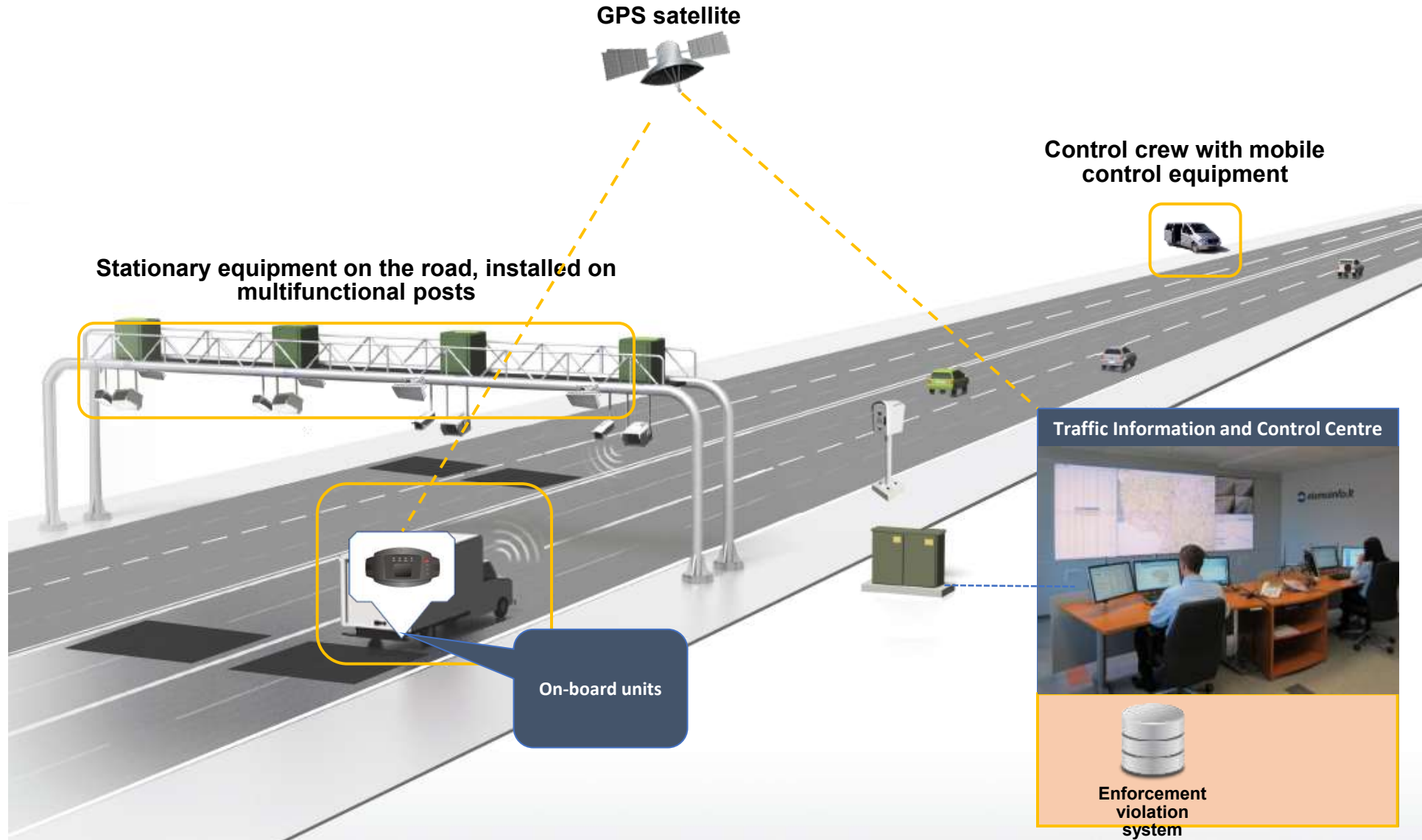
Registration number of vehicle:  
16AKG450

Verify

Country of registration: **Turkija**  
Licence plate number: **16AKG450**

Series	Status	Vehicle category	Emission level	Number of axles	Period	Start date of validity (EET)	Expiry date (EET)	Point of sale	Dealer	Dealer address
AR	Valid	N1	Euro VI	Not more than 3 axles	Day	2025-08-20 09:53	2025-08-30 09:53	BP78 Pasiekų	UAB „Baltic Petroleum“	Pasiekų k., Europos g. 12, Kašvarijs raj.
AR	Purchased	N1	Euro VI	Not more than 3 axles	Day	2025-08-30 09:51	2025-08-31 09:51	BP78 Pasiekų	UAB „Baltic Petroleum“	Pasiekų k., Europos g. 12, Kašvarijs raj.

# E-toll control & enforcement systems (e-tolling)



# Thank you for your attention!



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