



TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

Joint  
Nordic/Baltic  
Symposium on  
Pavement  
Design and  
Performance  
Indicators.  
Oslo 2008

# *HEAVY WEIGHT TRANSPORT ON E CATEGORY ROADS OF LITHUANIA*

*Transport and Road Research Institute*

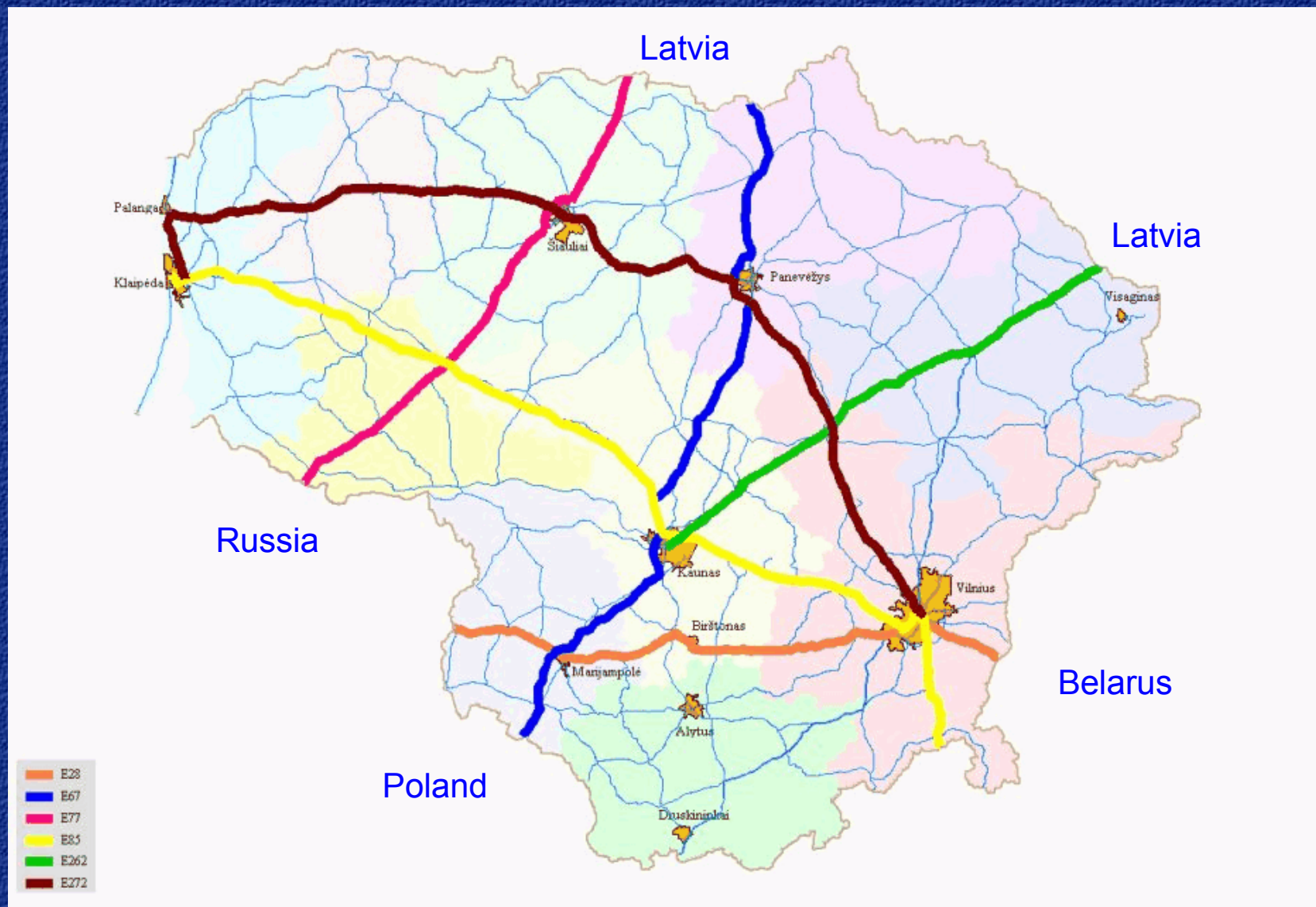
*Head of Road Survey Division Mindaugas Dimaitis*





TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

## E ROADS NETWORK IN LITHUANIA

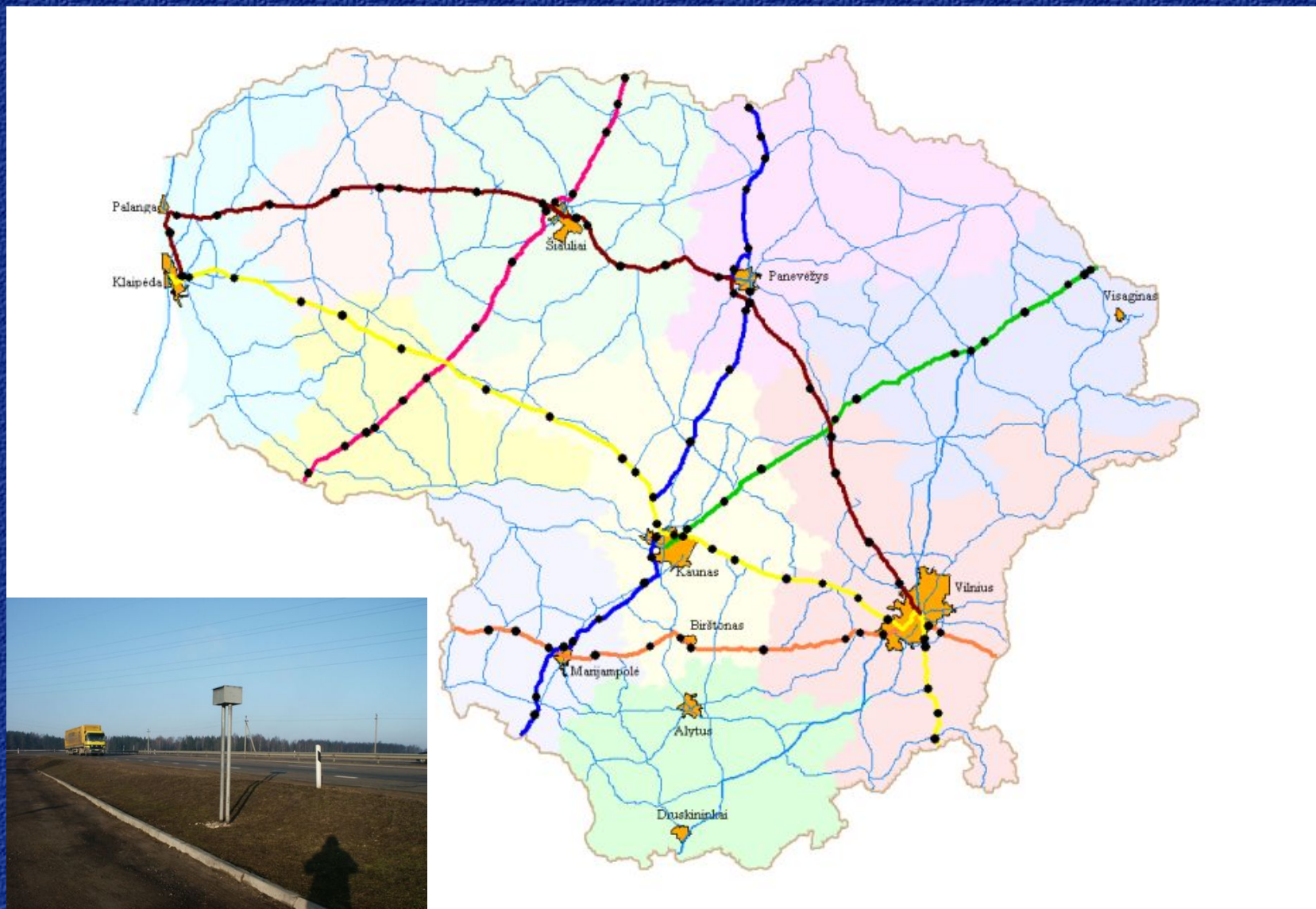


Total length– 1602 km



TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

## TRAFFIC COUNTING POSTS



Total amount of posts in 2007 – 118





TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

## GENERAL INFORMATION IN 2007

- Total length – 1602 km
- Total amount of the traffic counting posts – 118
- Average distance among the counting posts – 13,6 km
- Annual Average Daily Traffic – 8331 veh./day
- Annual Average Daily Traffic (Heavy Vehicles) – 1528 veh./day (18,3% of total traffic flow)
- Total annual traveled distance –  $4,7 \cdot 10^9$  km/year
- Total annual traveled distance of heavy vehicles –  $0,86 \cdot 10^9$  km/year

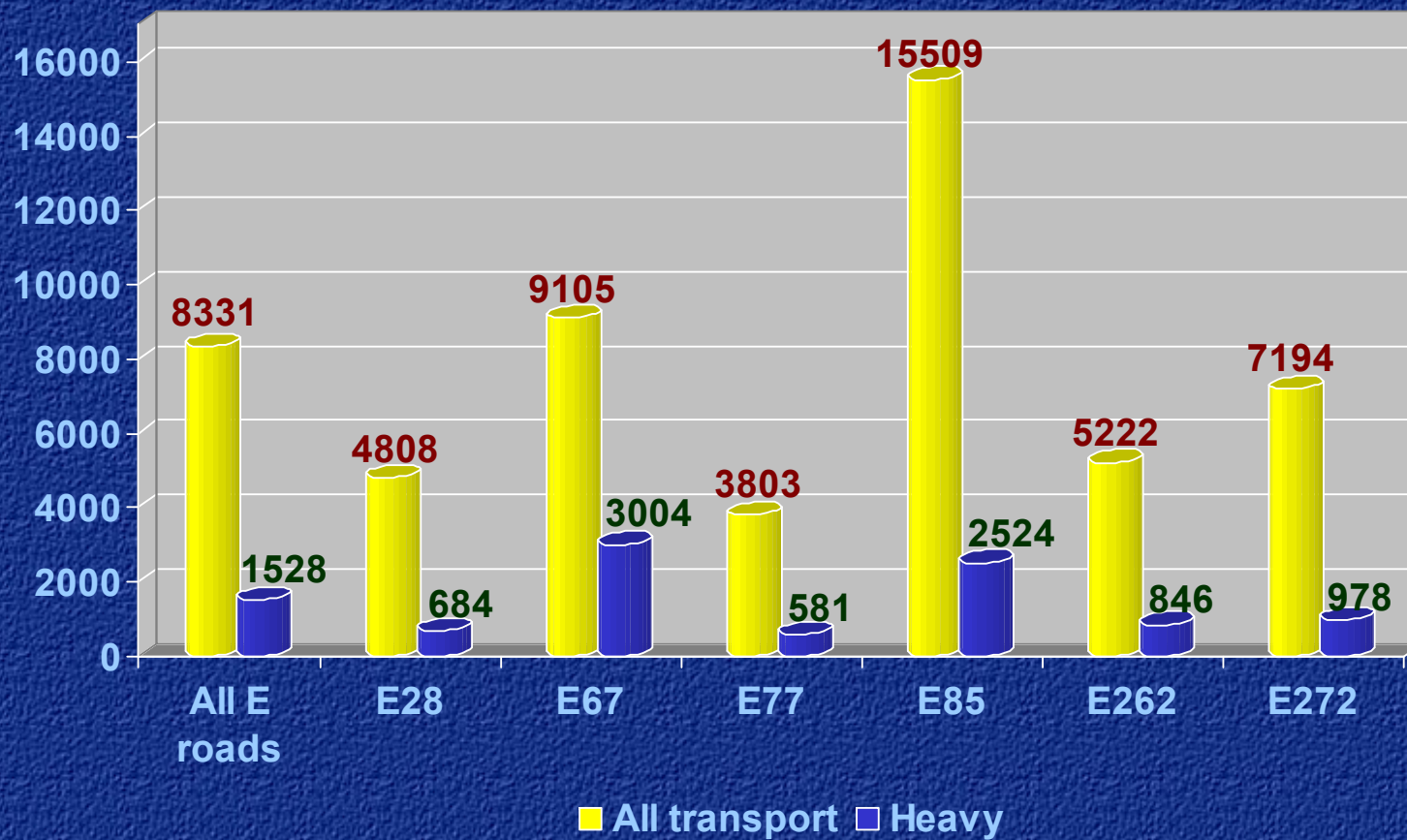






TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

## ANNUAL AVERAGE DAILY TRAFFIC IN 2007





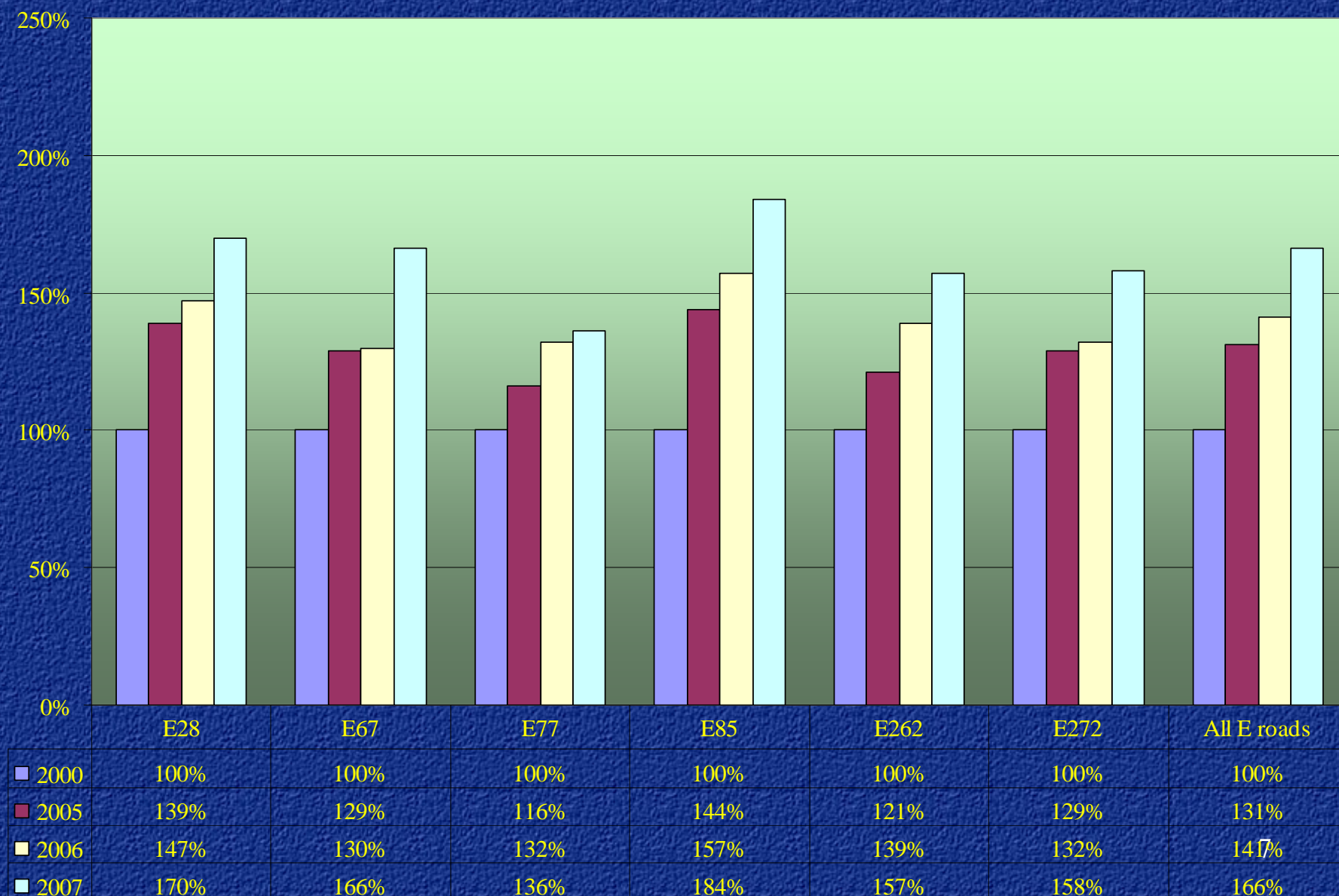
# TRAFFIC VOLUME OF HEAVY-GOODS VEHICLES



TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

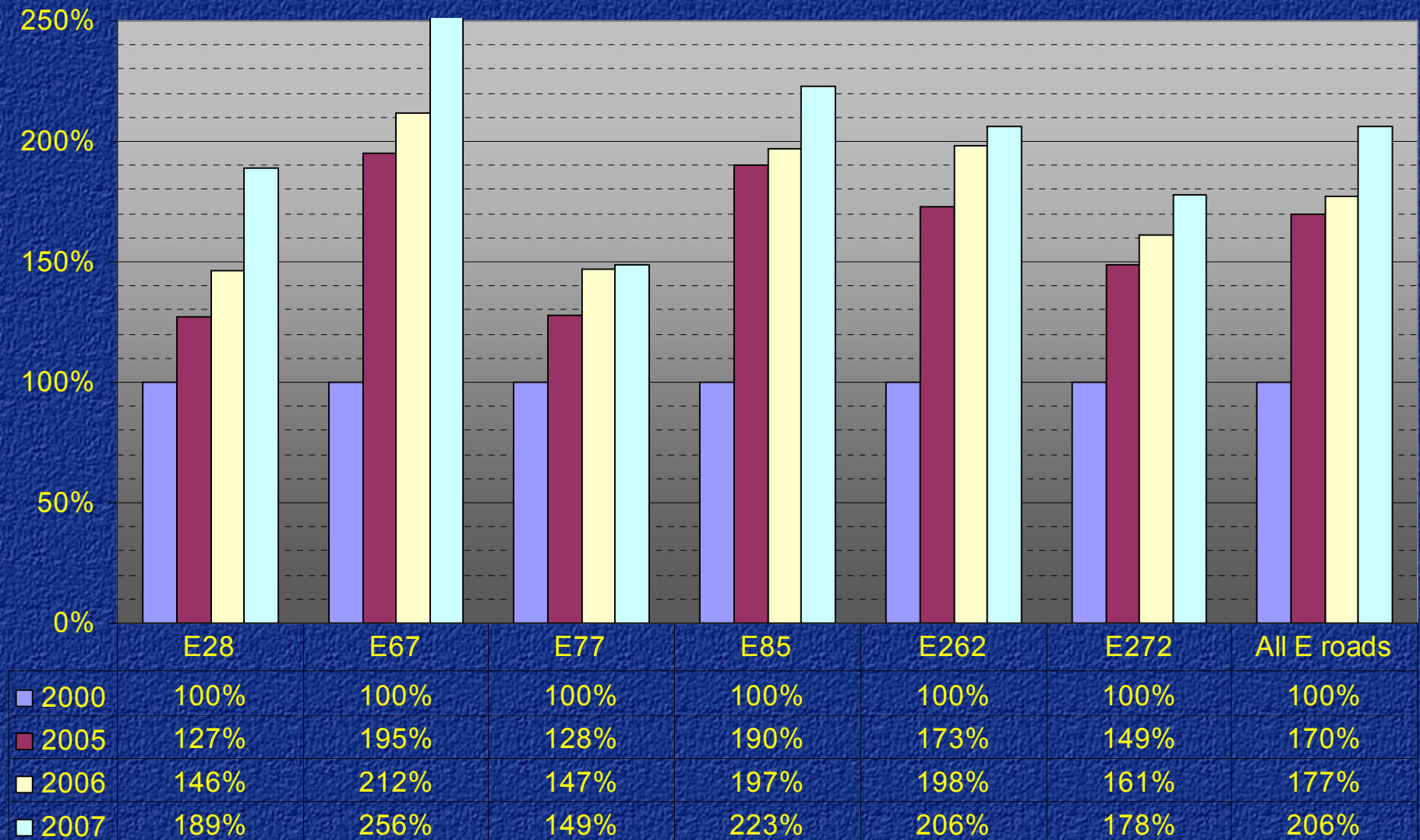


## CHANGES IN VEHICLE TRAFFIC IN 2000 - 2007



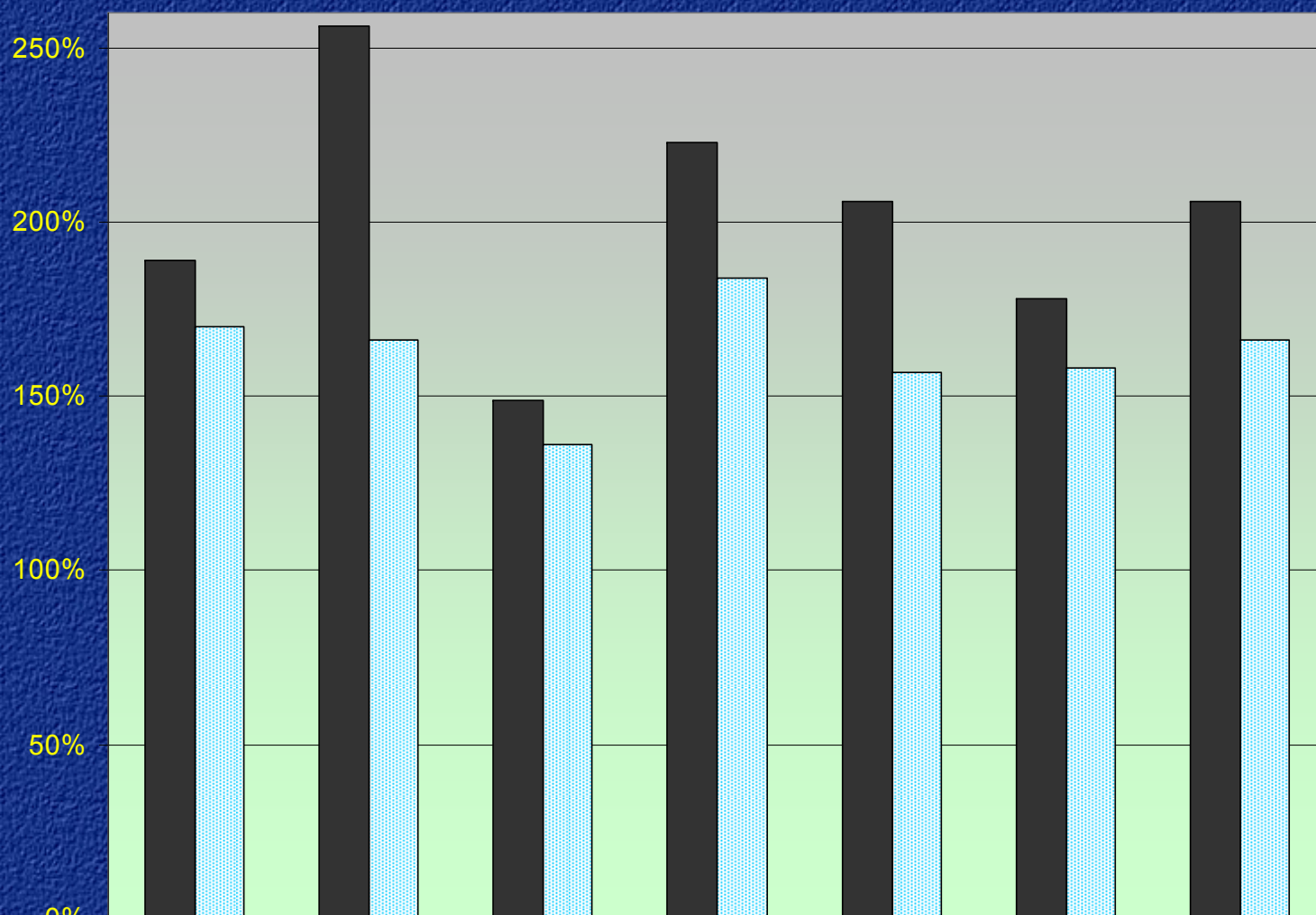


## CHANGES OF HEAVY-GOODS VEHICLE TRAFFIC IN THE PERIOD 2000 - 2007





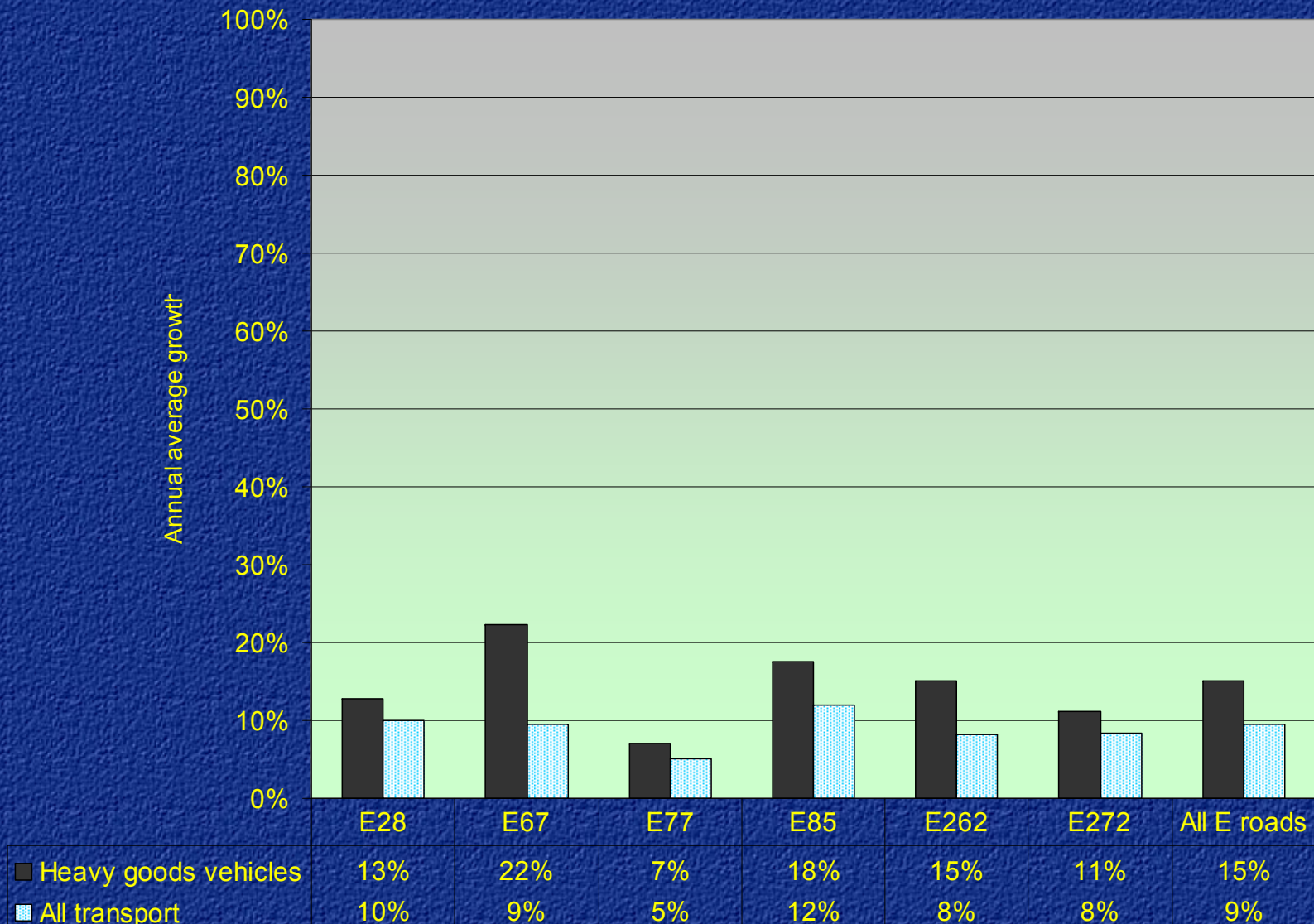
## COMPARISON OF TRAFFIC VOLUMES IN 2000 AND 2007



■ Heavy goods vehicles	189%	256%	149%	223%	206%	178%	206%
■ All transport	170%	166%	136%	184%	157%	158%	166%



## ANNUAL AVERAGE GROWTH OF TRAFFIC VOLUMES DURING THE PERIOD 2000-2007

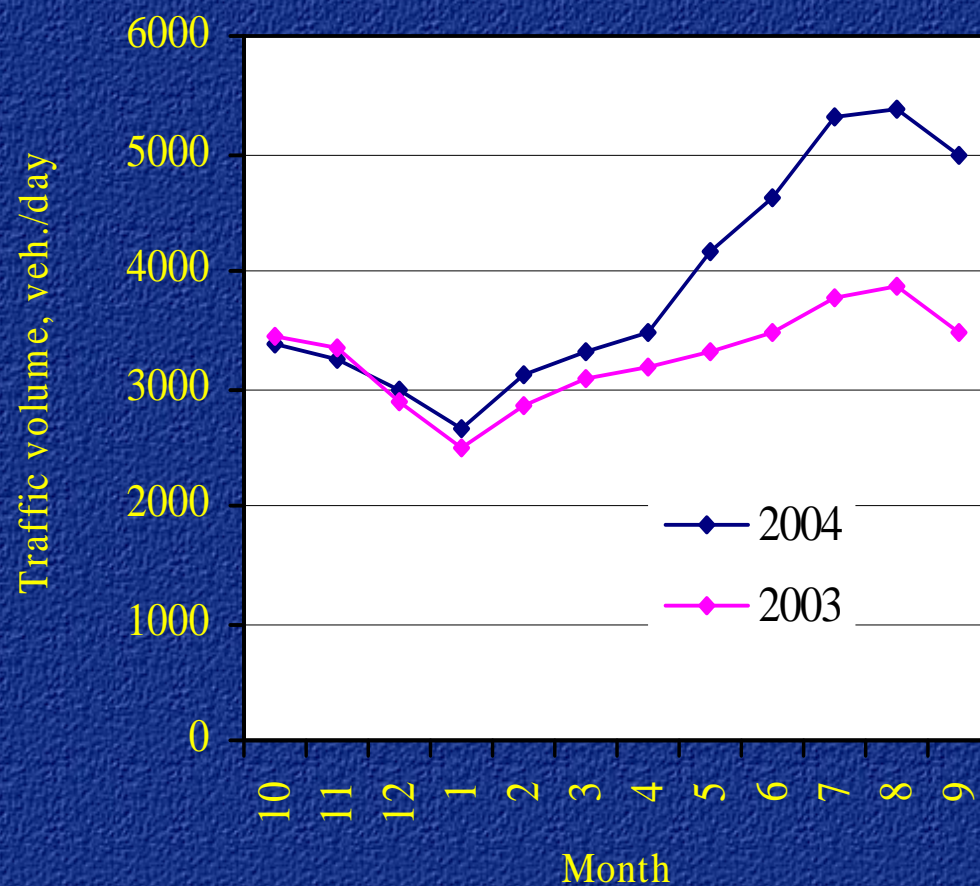






TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

## CHANGES IN TRAFFIC VOLUME ON THE ROAD E67 (VIA BALTICA) AFTER ENTERING THE EU

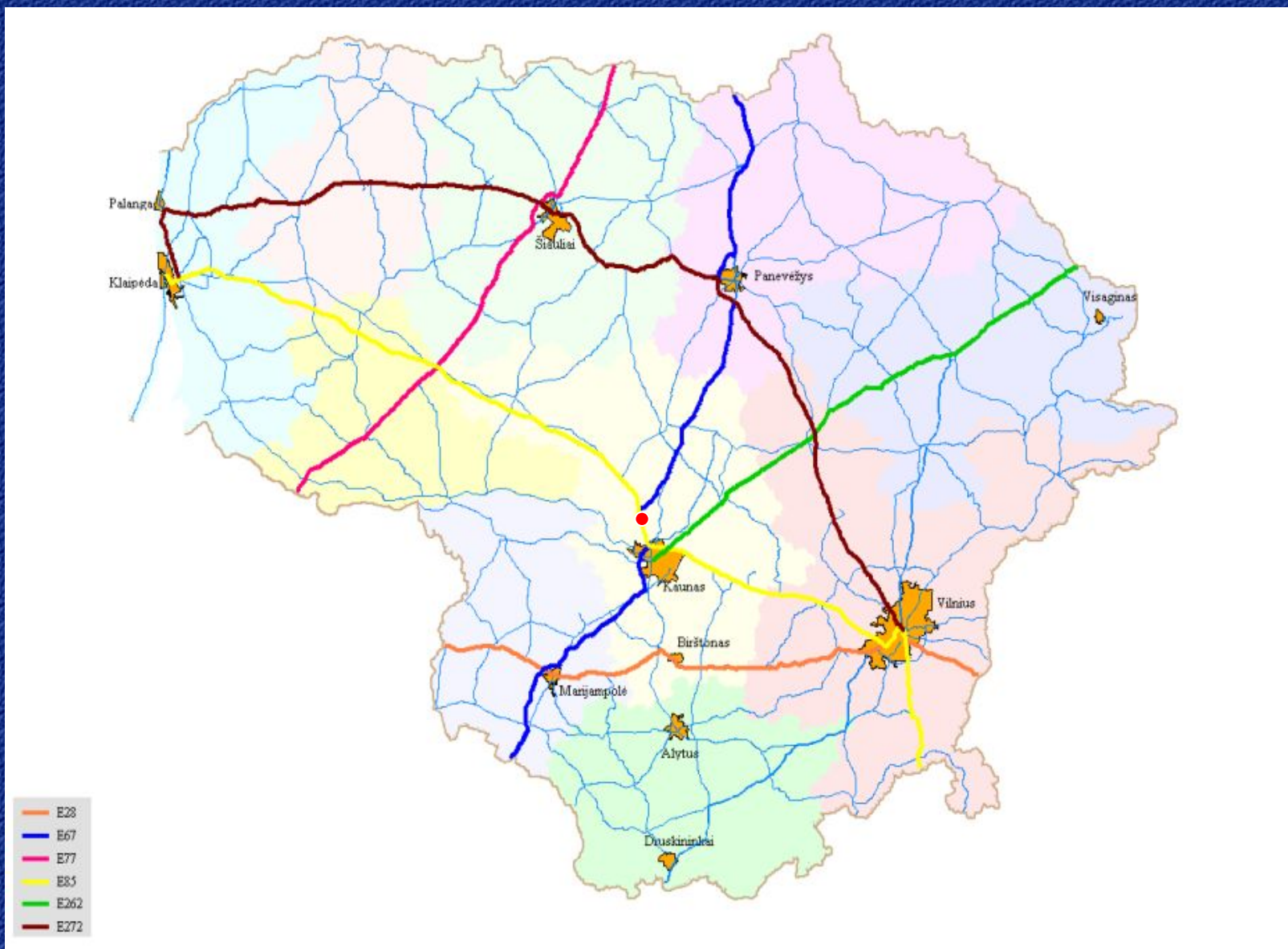




# WEIGHT-IN-MOTION



TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS



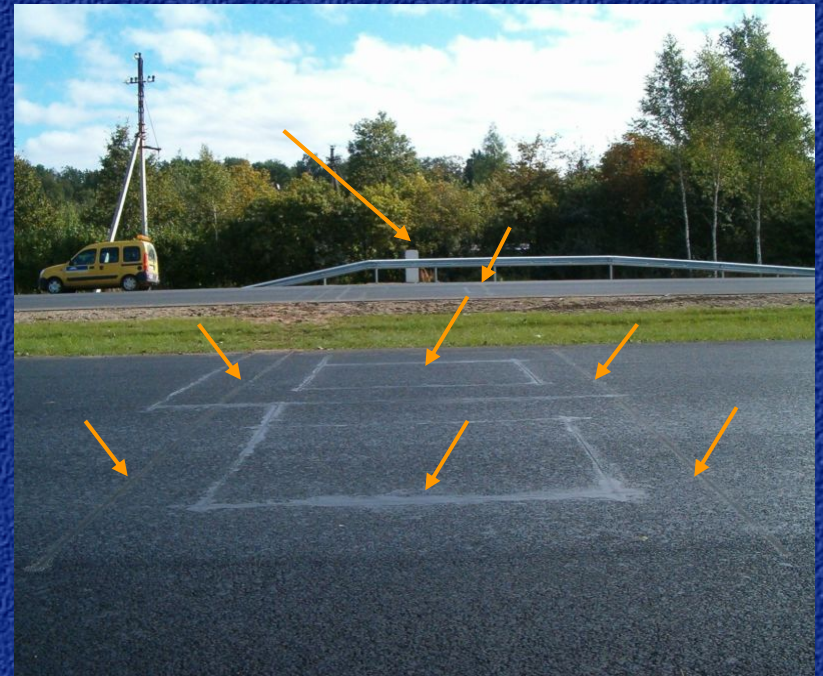




TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

## MAIN PARTS OF HI-TRAC® 100

- Processor to process data
- Piezo electric sensors measure axle load, vehicle speed and inter-axe spacing
- Induction loop detects vehicle length
- Temperature sensor to correct a signal of piezo electric sensors
- GSM modem linked with satellite to communicate data







TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

## ACCURACY DATA OF HI-TRAC® 100

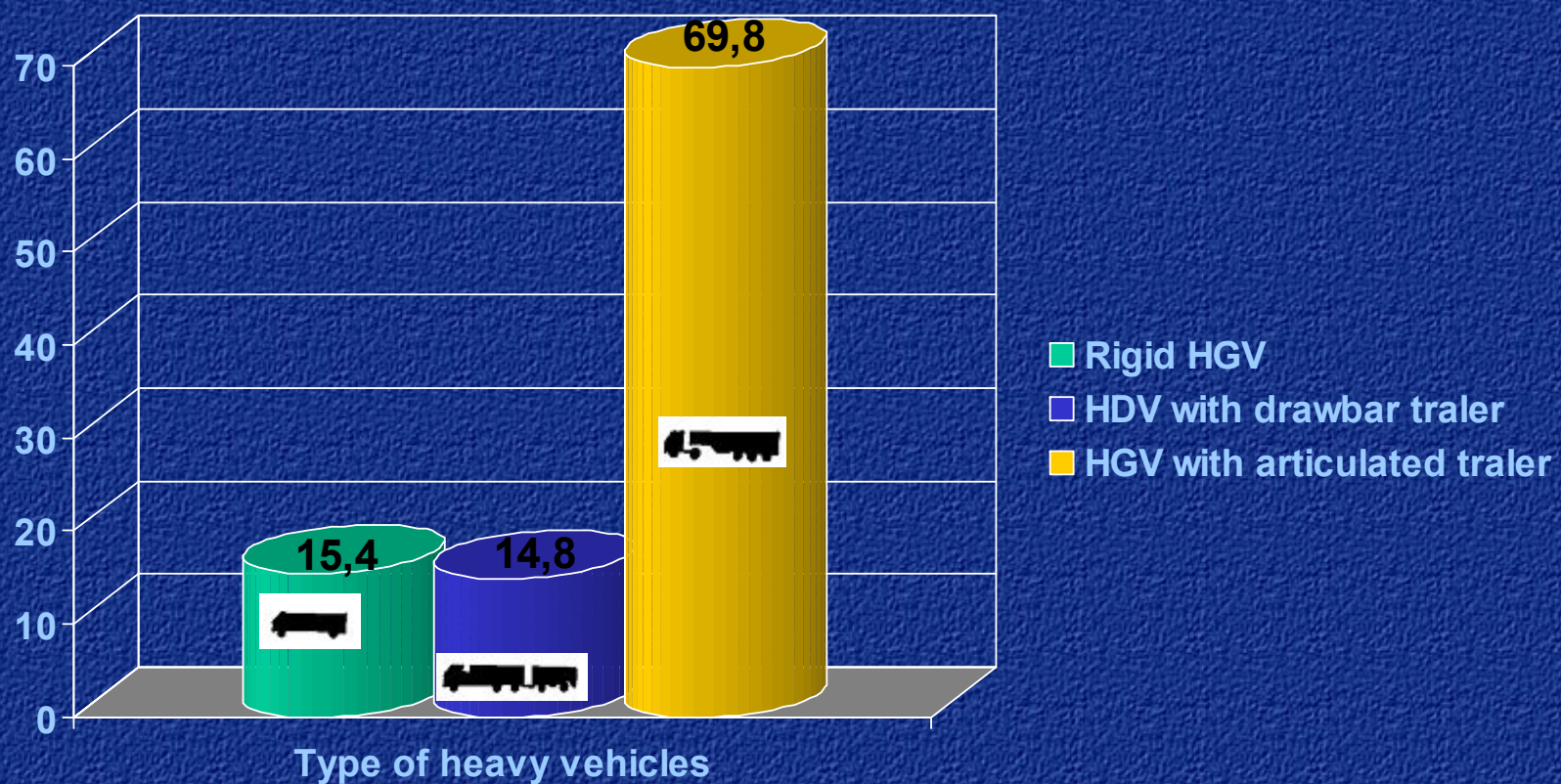
- **Gross vehicle weight –  $\pm 10\%$**
- **Individual axle weight –  $\pm 15\%$**
- **Vehicle speed –  $\pm 1.5\%$**
- **Vehicle length –  $\pm 8\%$**





TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

## DISTRIBUTION OF HEAVY-GOODS VEHICLES IN 2007







TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

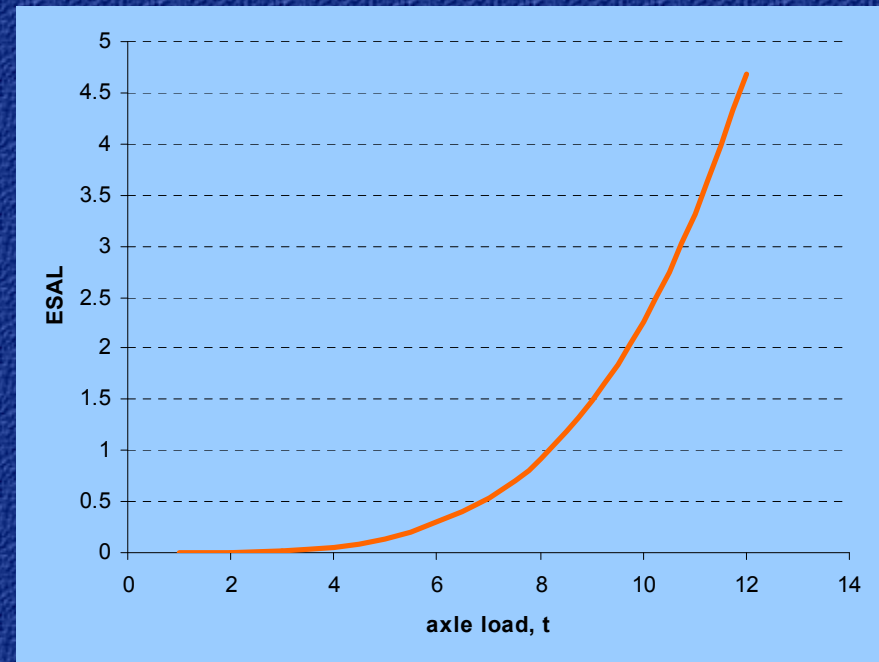
## THE EFFECT OF HEAVY VEHICLES ON ROAD PAVEMENT

ESAL (equivalent standard axle load) – value to detect the effect of heavy-goods vehicles on road pavement

$$ESAL_{80} = \left( \frac{m}{8.157} \right)^4 ;$$

$m$  – axle load, t.

8,157 – weight of standard axle load, t.

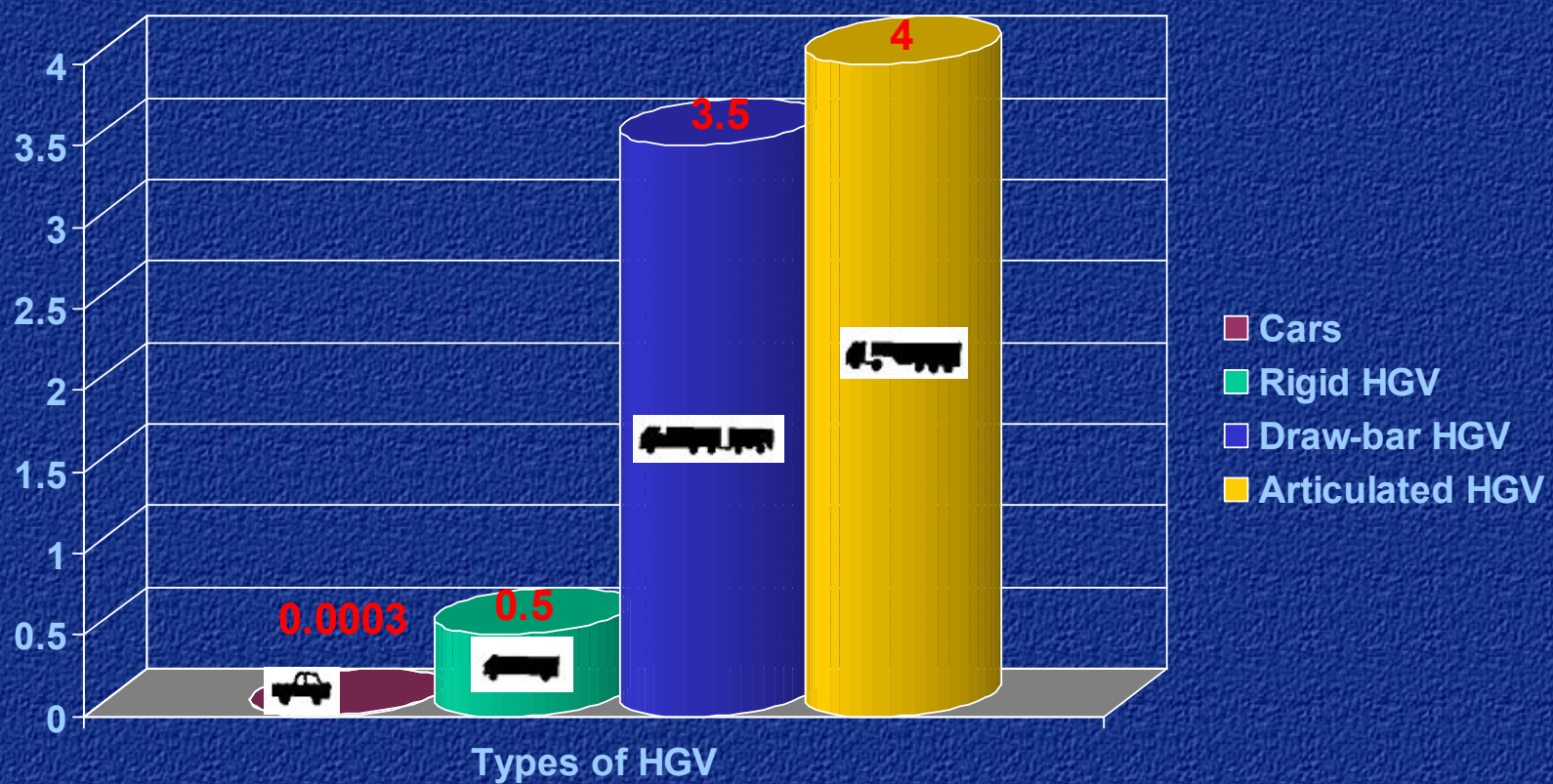






TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

## AVERAGE “ESAL” OF VEHICLE TYPE

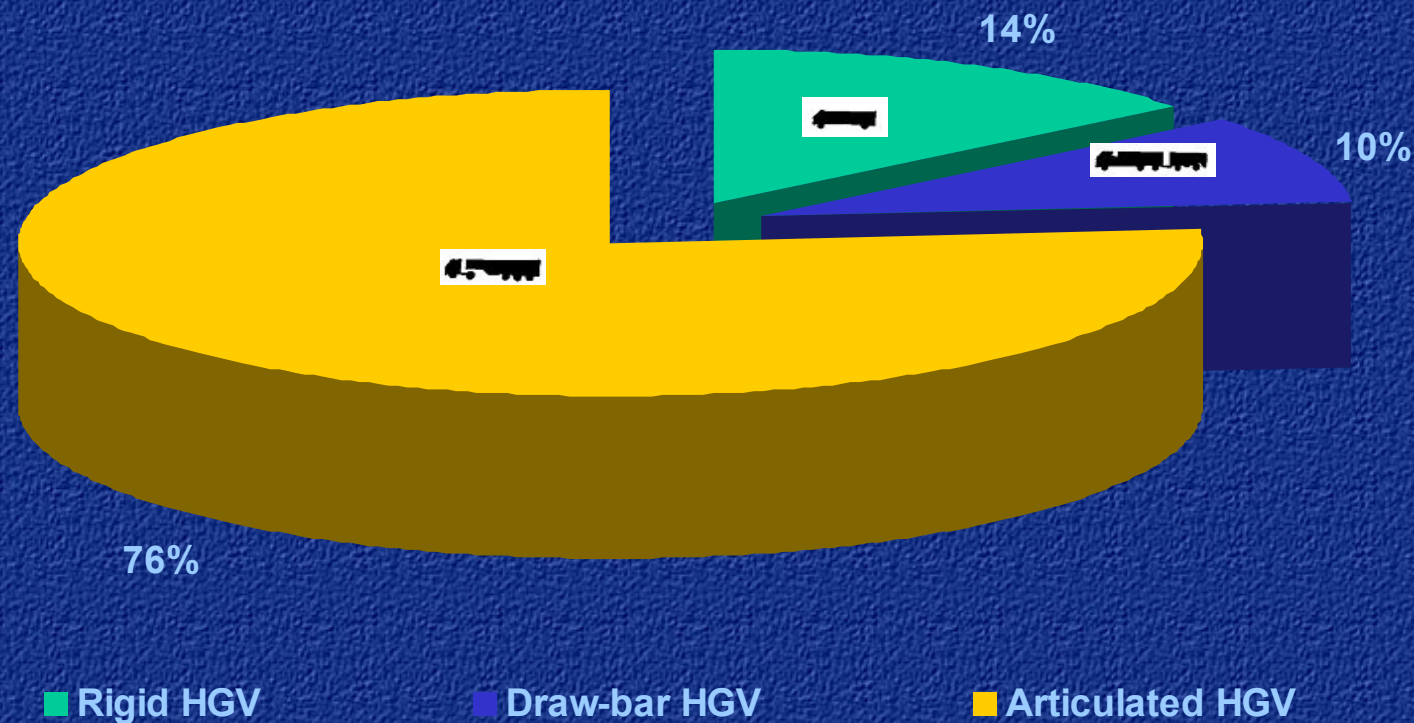






TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

## DISTRIBUTION OF OVERLOADED HGV IN 2007

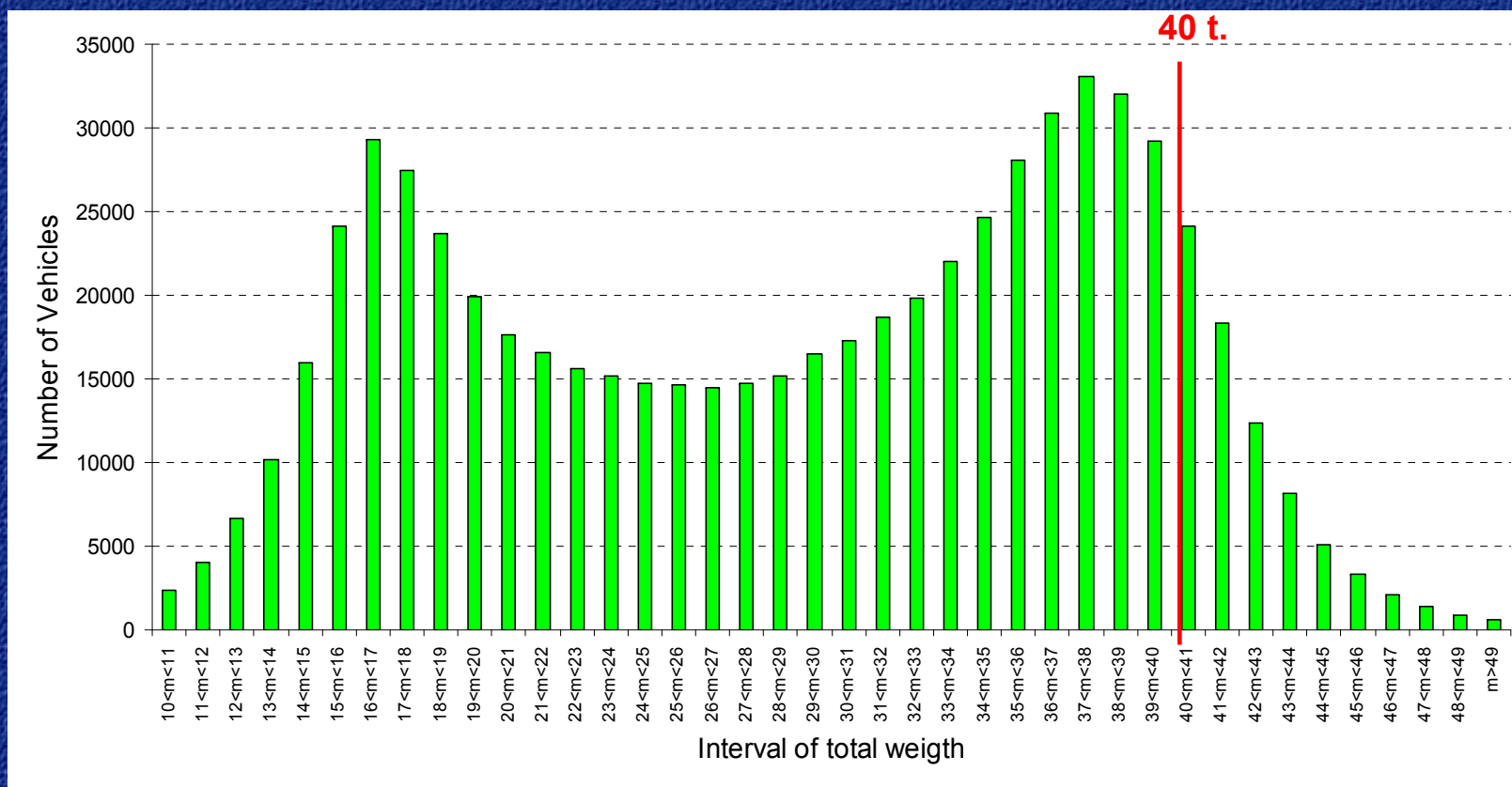






TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

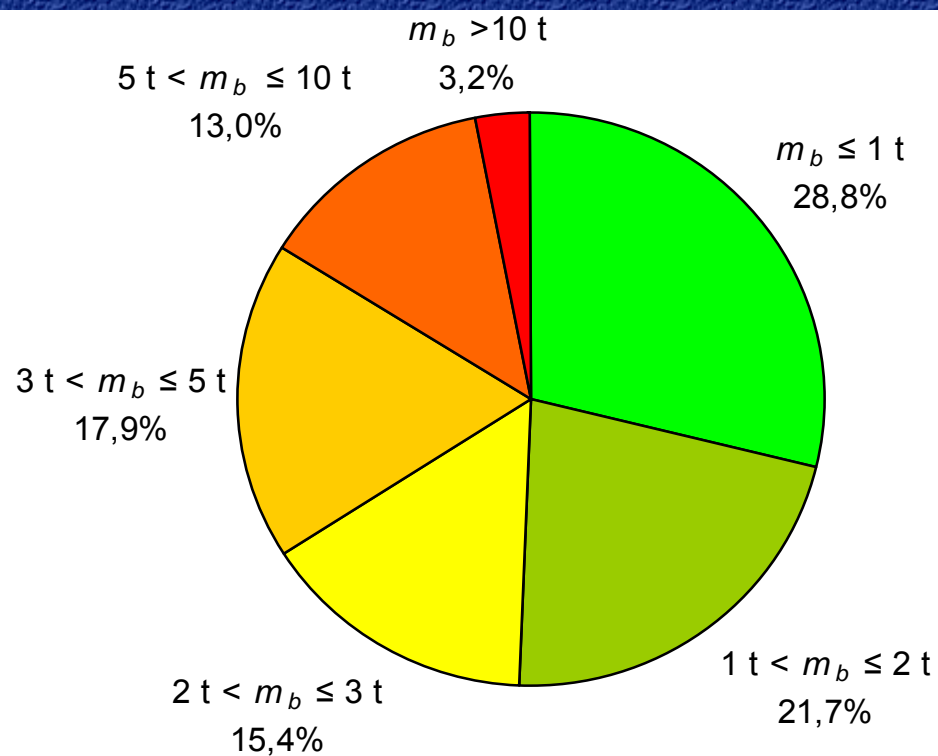
## DISTRIBUTION OF TOTAL WEIGHT OF ARTICULATED HEAVY GOODS VEHICLES







## DISTRIBUTION OF VEHICLE WEIGHT BY A MAGNITUDE OF THE OVERLOAD $m_b$ IN 2007

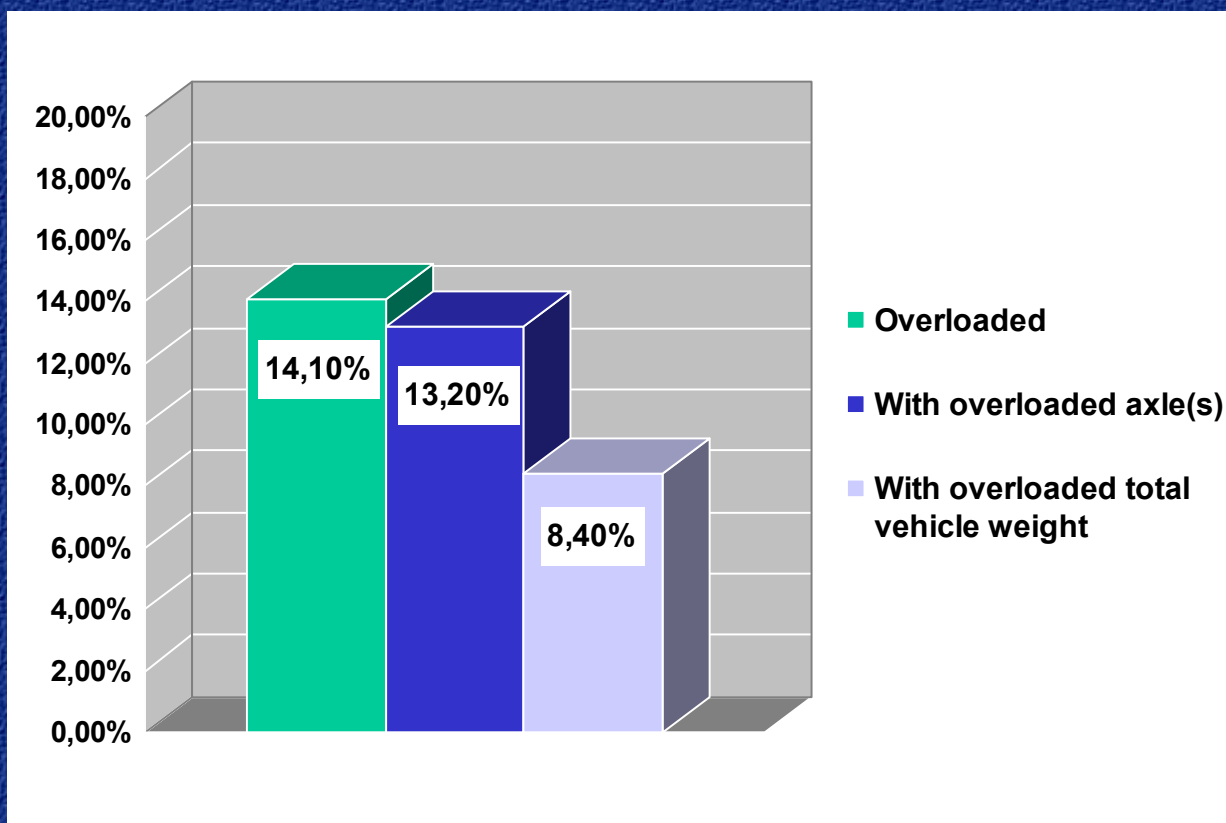






TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

## PERCENTAGE OF OVERLOADED HEAVY VEHICLES FROM TOTAL HEAVY VEHICLES

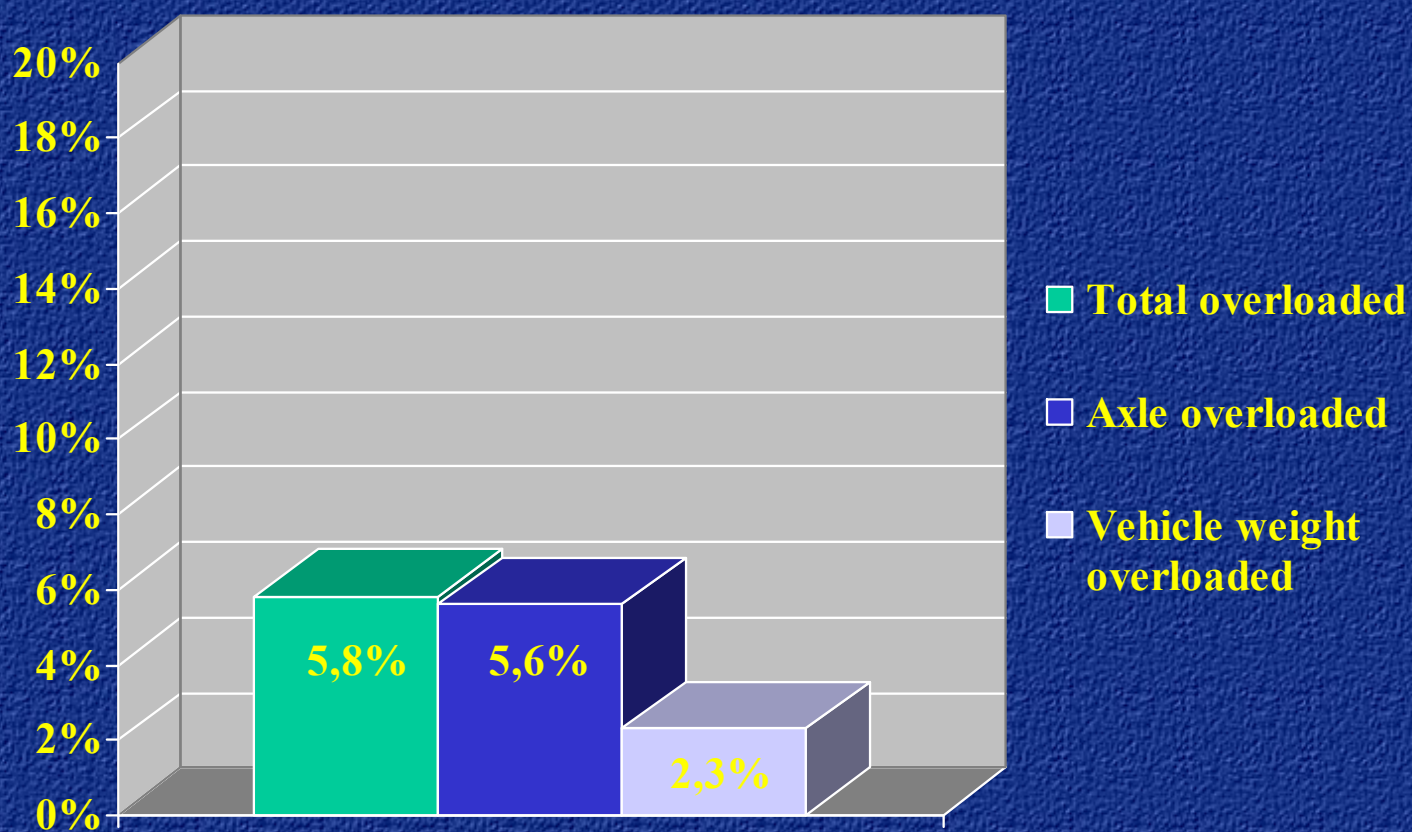






TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

## PERCENTAGE OF OVERLOADED HEAVY VEHICLES FROM TOTAL HEAVY VEHICLES (excluding bias of device)







## CONCLUSIONS

- The highest traffic volume of heavy-good vehicles are on the road E67 – (annual average daily traffic - 2860 veh./d.) and on the road E85 (2420 veh./d). Traffic volume on the other E roads are more than 50% less.
- The growth of HGV annual average daily traffic on E roads during the period 2000 – 2007 are higher than the growth of the total traffic volume (15% and 9%, respectively).
- In 2007 on the coincident road section of the roads E67 and E85, 14% of the HGV were detected overloaded.
- 76% of the overloaded HGV - articulated trailers.





TRANSPORTO  
IR KELIŲ  
TYRIMO  
INSTITUTAS

THANK YOU FOR YOUR  
ATTENTION