

19TH OSCE ECONOMIC AND ENVIRONMENTAL FORUM
 "Promotion of common actions and co-operation in the OSCE area in the fields of development of
 sustainable energy and transport"
 SECOND PREPARATORY MEETING
 DEVELOPMENT OF SUSTAINABLE TRANSPORT
 Druskininkai, Lithuania, 4-5 April 2011

Relation between traffic safety and environmental protection



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**LIETUVOS AUTOMOBILIŲ
 KELIŲ DIREKCIJA**

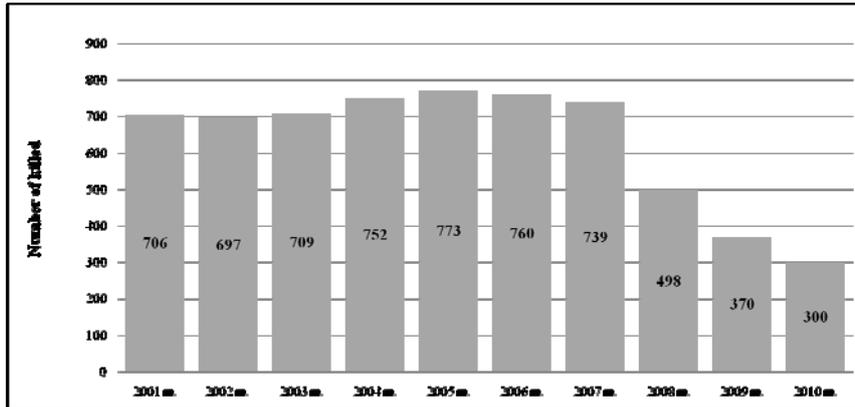
Lithuanian Road Administration and Lithuanian roads, transport fleet, population

- The Lithuanian Road Administration under the Ministry of Transport and Communications is in charge of organizing and co-ordinating the *reconstruction, maintenance and development* of the roads of national significance;
- The top priority is to ensure *traffic safety and road users interests*;
- The Structure of the Road Network of National Significance (01-01-2009):
 main roads – 1748,456 km;
 national roads – 4946,472 km;
 regional roads – 14625,304 km;
 Total – 21320,232 km.
- Municipalities and local roads about – 57000 km;
- Population – 3,329 mln. inhabitants;
- Total transport fleet – 2144548 cars;
- Light cars - 1734047 cars;
- Light cars for 1000 inhabitants is growing: 1991 – 234,4 cars/1000inh., 2008 – 625,9 cars/1000inh.

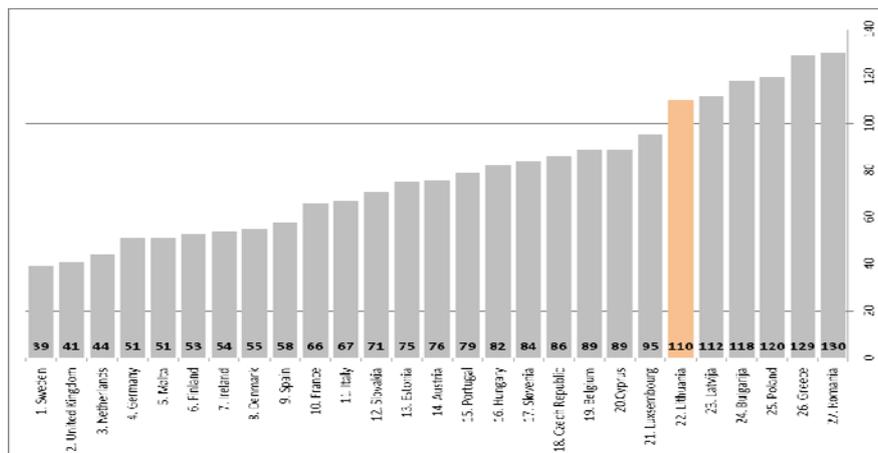


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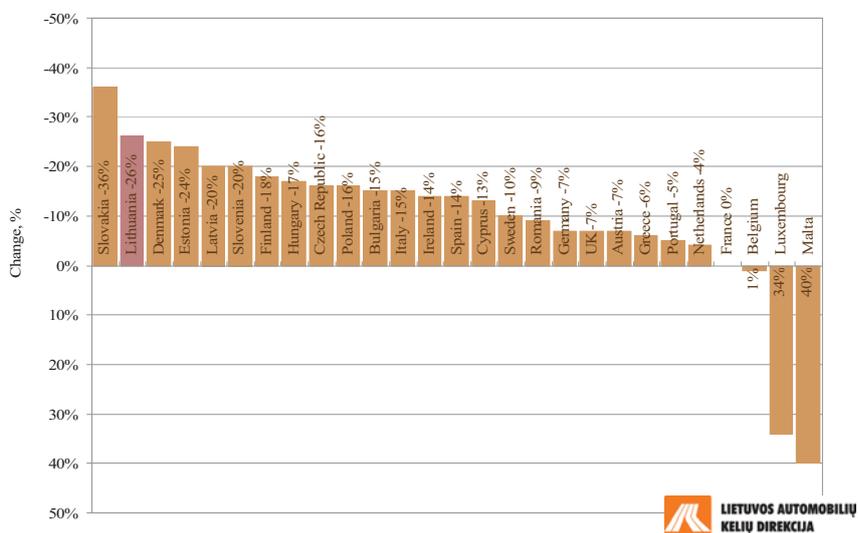
Change in the number of people killed on the roads in Lithuania, 2001–2010



Number of people killed on the roads in European Union countries per 1 million inhabitants, 2009



Change in the number of people killed on the roads in European Union member-states, 2008–2009



Measures for the reduction of accident rate

Massive efforts are made to improve the existing situation:

- the Code of Administrative Violations of Law is made more strict;
- penalties for road traffic violations are on the increase;
- wide educational activity is exercised;
- system of drivers training is on improve;
- requirements for the technical condition of cars and the maintenance inspection of transport means are becoming more strict;
- Speed Enforcement System network has started to function on the national roads and city streets;
- various engineering measures to improve traffic safety are implemented;
- documentation regulation and designing legislation are on change;
- research work;
- etc.

Relation between traffic safety and environmental protection

Traffic safety in almost all cases has relation with environment protection!!!!!!

Using right engineering measures for traffic safety it is possible to do a very big positive influence not just to accident rate but to environment protection too!!!!!!



Analysis of effectiveness of traffic safety measures, implemented in the in the period of 2001-2006

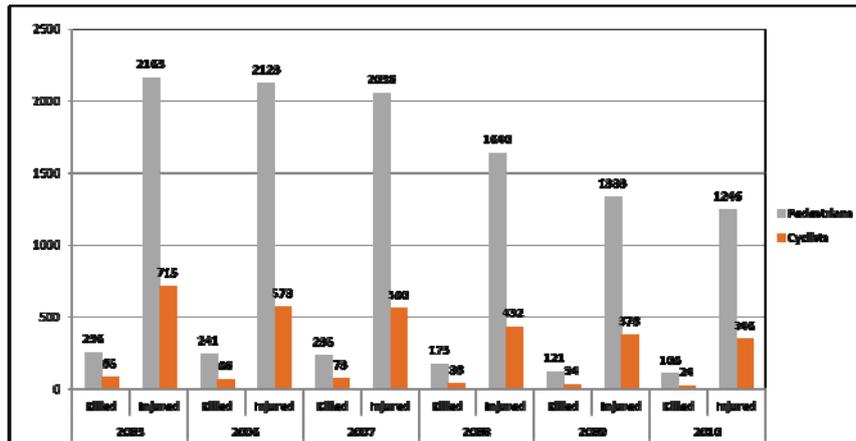
In the period of 2001-2006 on the roads of national significance various traffic safety improving measures were implemented.

With the view of analysis of an impact of the implemented measures 49 sections were selected.

Main criterion of selection of the sections – measure has to be implemented in the "black spot". In the investigation only registered road accidents are analyzed. In the sections under investigation the implemented measures are divided in 4 groups.

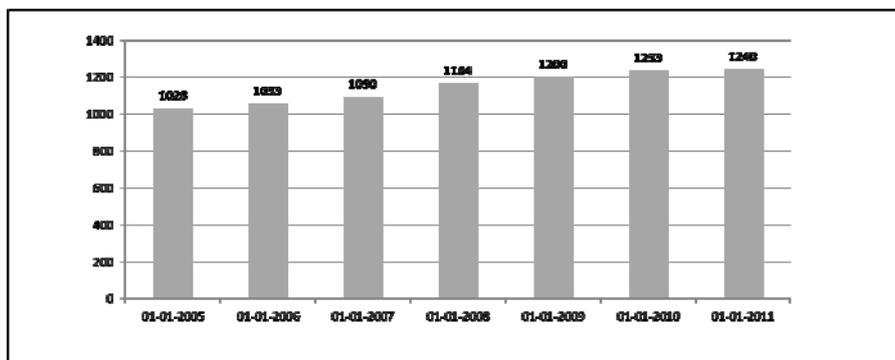
No	Type of traffic safety improving engineering measures	Completion
1	Lighting	11
2	Pedestrian-cycling pathways	15
3	Reconstruction of intersection into roundabout	20
4	Reconstruction of intersection into traffic-light intersection	3

Number of killed and injured vulnerable road users in traffic accidents, 2005-2010



Infrastructure for Improving the Safety of Pedestrians and Cyclists and Environmental Protection

From 2005 till 1 January 2011, the length of walkways and cycle tracks near the roads of national significance increased from 1028 km to 1240 km

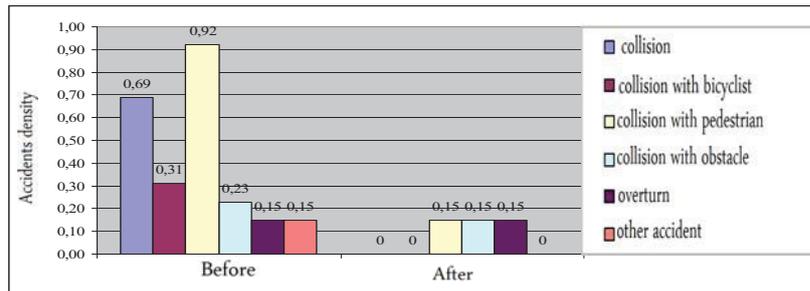


Pedestrian and cycling pathways

For the investigation 15 road sections of various length were selected in which the pedestrian-cycling pathways have been installed.

Before installation of the pathways on 1 km of the road medium 2,46 registered road accidents were happening, in which 2,46 traffic participants were killed and 2,99 injured. After the pedestrian-cycling pathways were installed – 0,46 road accidents happened, 0,15 people were killed and 0,38 injured.

Installation of pedestrian and cycling pathways exercised greatest influence on the decrease of accidents, in which the pedestrians and cyclists suffered damages.



If built pedestrian/cycle pathway is comfortable and safe – more users choose to go by bicycle or go on foot not by car and the air pollution will be lower;

In 2011 will be done research work how many and how long trips can be changed from “car’s trip” to “green” and “healthy” trip because of good pedestrian/cycle pathways network.

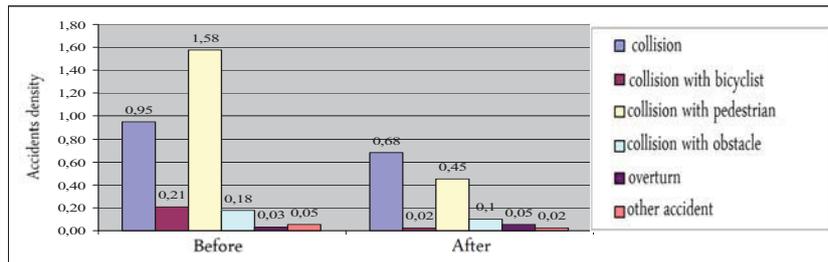


Lighting

To execute an investigation 11 various road sections were selected in which lighting has been installed.

Before installation of the lighting on 1 km of the road medium 3 registered road accidents were happening, in which 0,71 traffic participants were killed and 3,35 wounded. After the lighting was installed – 1,33 road accidents happened, 0,19 people were killed and 1,92 wounded.

When the lighting was installed most of all the number of pedestrian accidents and the collisions with bicycles was decreasing



Lighting and Radar Speed Signs

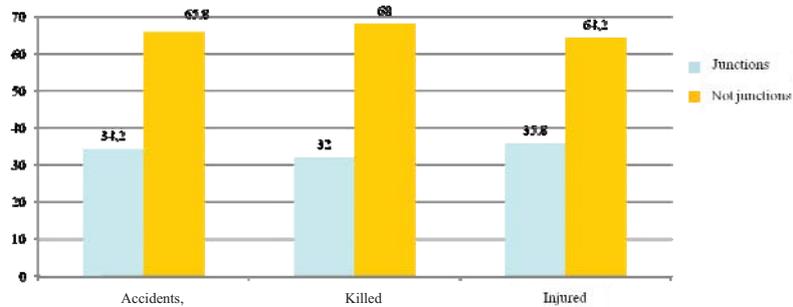
Lamps with solar batteries can be used. More efficient LED lamps can be used. Less electric energy is needed to use for lightening less pollution is made by power station.

In case of running out of solar battery energy, it would be generated by the wind. The use of energy from renewable resources is more economical and ecological.

In 2011 – 2012 effectiveness of solar and wind power, more efficient central controlling and LED lamps will be researched.



Accidents in junctions



	Junctions	Not junctions
Accidents, %	34,2	65,8
Death, %	32	68
Injuries, %	35,8	64,2

Reconstruction of the crossings into roundabouts

To investigate the effectiveness 20 road sections were selected in which the four-way crossings were reconstructed into roundabouts.

Before the construction of the roundabout on the crossing medium 1,25 road accidents were happening, in which 0,25 traffic participants were killed and 2,08 injured. After the roundabout was installed no valid road accidents were registered.

Reconstruction of the crossings into traffic-light crossings

To investigate the effectiveness of traffic lights controlled junctions 3 road sections were selected where the four-way crossings were reconstructed into traffic-light crossings.

Before the reconstruction of the crossings on the crossing medium 1,50 road accidents were happening, in which 0,25 traffic participants were killed and 0,58 wounded. After the crossings were reconstructed - 2,00 road accidents happened, 0,33 people were killed and 3,50 wounded.

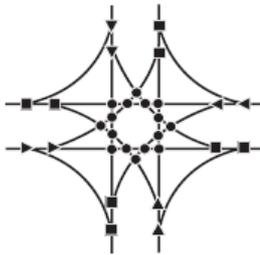
After the crossings were reconstructed into traffic-light crossings it was noticed that the number of collisions on the crossings was increasing.

Reconstruction of Intersections

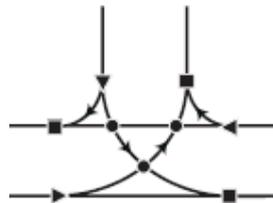
Modern roundabouts improve safety, traffic conductivity and aesthetics as well as reduce environmental pollution.



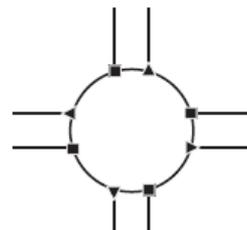
Junctions conflict points



Four leg junction
32 conflict points



Three leg junction
9 conflict points

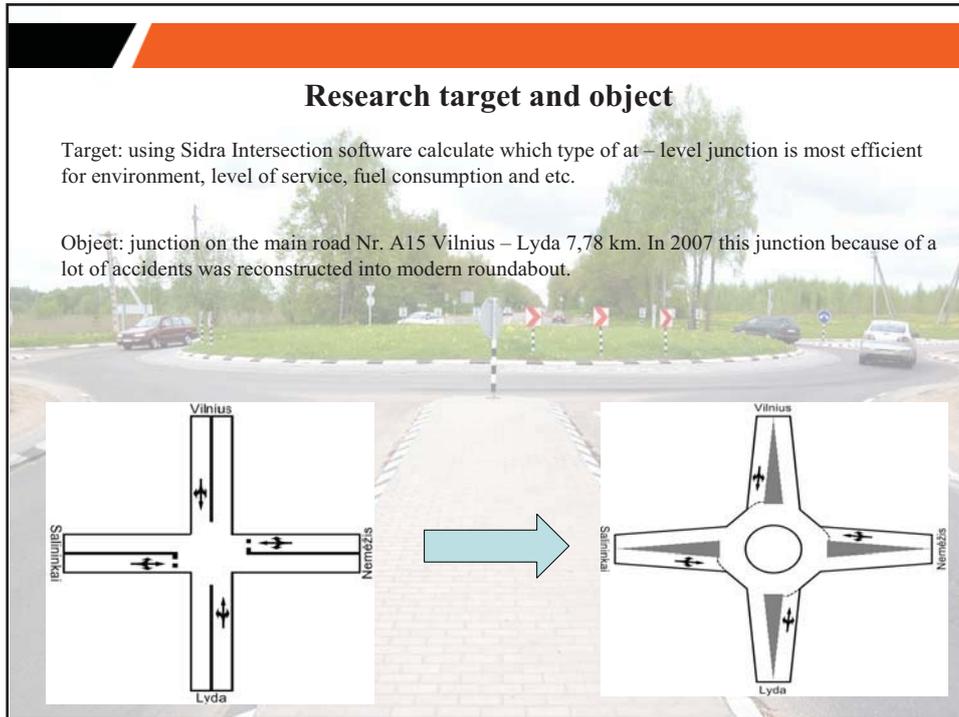


Roundabout
8 conflict points

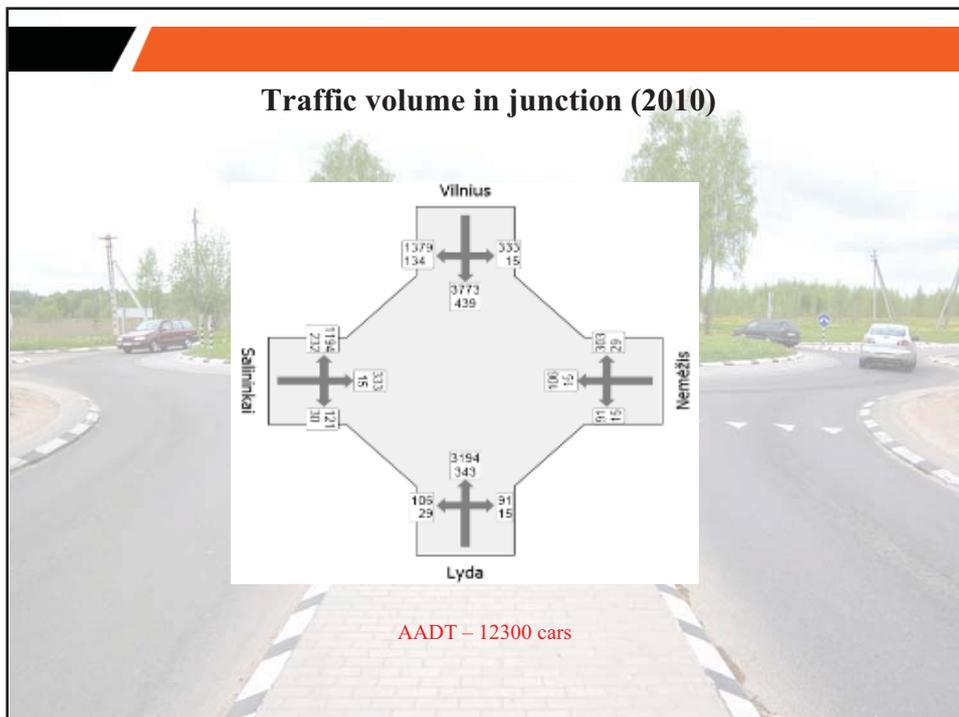
Research target and object

Target: using Sidra Intersection software calculate which type of at – level junction is most efficient for environment, level of service, fuel consumption and etc.

Object: junction on the main road Nr. A15 Vilnius – Lyda 7,78 km. In 2007 this junction because of a lot of accidents was reconstructed into modern roundabout.



Traffic volume in junction (2010)



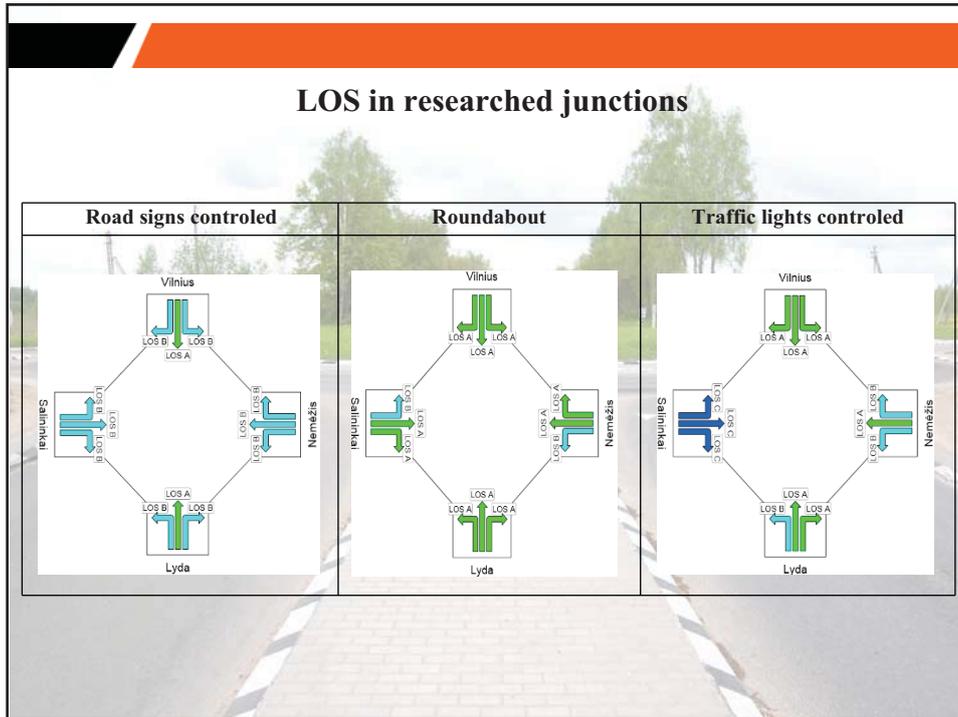
Main parameters

Parameters	Type of junction		
	Roundabout	Road signs controlled	Traffic lights controlled
Entry/exit lane width, m	4 / 4,5	3,5 / 3,5	3,5 / 3,5
Traffic island, m	2	-	-
Number of traffic lanes	1	1	1
Width of center island, m	28	-	-
Circulating lane width, m	6,5	-	-
Average price of fuel, Lt	4,4	4,4	4,4
Traffic signals phase, s	-	-	30
Speed before and after junction, km/h	50/50		
Average weight of light car/truck, kg	1400/11000		

Results

Results	Type of junction		
	Roundabout	Road signs controlled	Traffic lights controlled
Effective capacity, cars./h	3084	2091	1666
LOS/Left turn LOS	A/B	A/C	B/B
Saturation of junction	0,234	0,345	0,433
Average waiting time, s/aut.	4,4	5,9	10,4
Fuel consumption, L/h	48,9	50,3	53,1
Average time to pass junction, s	47,2	49,5	53,9
Polution, kg/h CO ₂ / CO/ NO _x	122,8/ 0,168/ 0,243	126,3/ 0,177/ 0,253	135,3/ 0,195/ 0,284

LOS in researched junctions



Influence of traffic safety measures on the road accidents and their consequences

No.	Measure name	Alteration, %		
		Road accidents	Killed	Injured
1	Lighting	- 55,8	- 73,0	- 42,6
2	Pedestrian-cycling pathways	- 81,0	- 93,8	- 87,2
3	Reconstruction of intersection into roundabout	- 100,0	- 100,0	- 100,0
4	Reconstruction of intersection into traffic-light intersection	+ 33,0	+ 33,0	+ 500,00

No	Measure name	Types of road accidents	Alteration of road accidents, %
1	Lighting	Collisions	- 28,1
		Accidents with pedestrians and cyclists	- 73,7
		Collisions with an obstacle	- 44,3
3	Pedestrian-cycling paths	Accidents with pedestrians and cyclists	- 87,5

Traffic enforcement

- Stationary speed cameras considerably reduce the number of fatalities
- 2006 - 2 units
2008 - 12 units
2009 - 151 units
- and 11 mobile speed cameras
- The less is speed, the less pollution to environment is.
 - In 2011 will be researched effectiveness of speed cameras to traffic safety and environment pollution.



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ITS

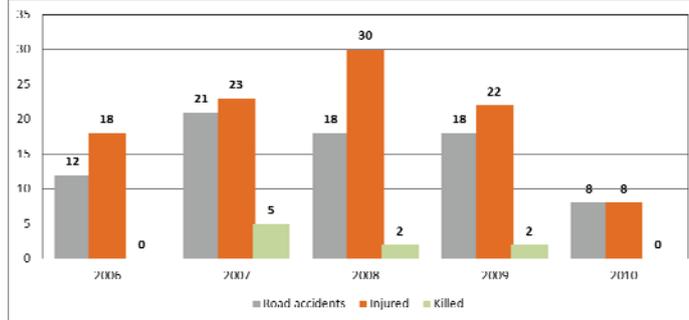
- Traffic Information Centres;
- Traffic Information System;
- Traveller Information Services' deployment;
- Variable signs;
- Traffic regulation centres;
- Etc.

More possibilities to plan trip less pollution !



 LITHUANIAN ROAD
ADMINISTRATION

Statistics: animal-involved road accidents on the roads

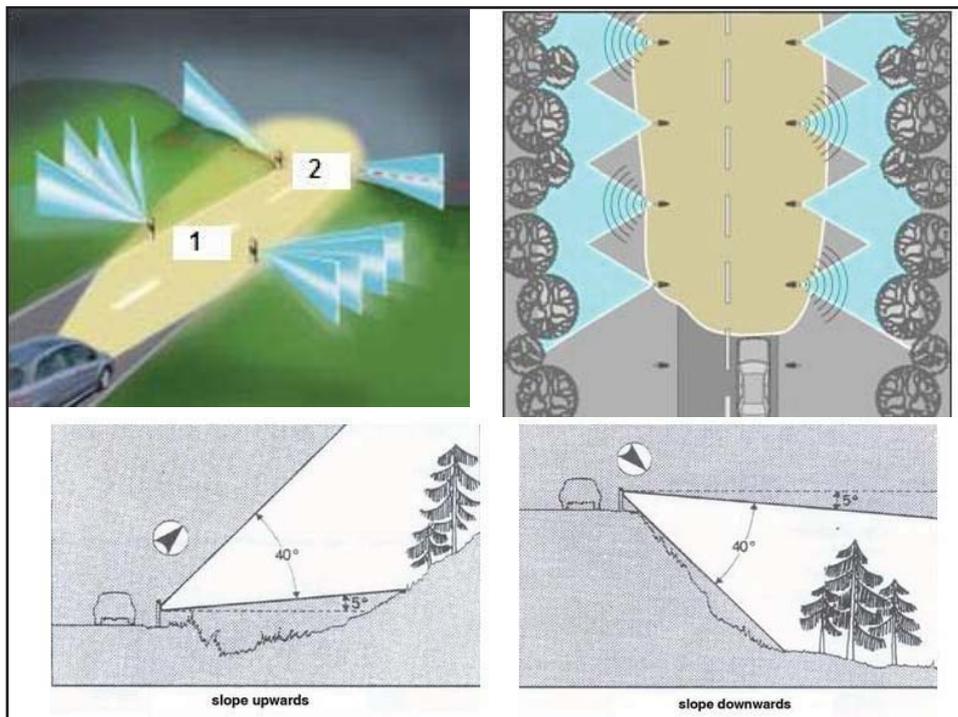


Implementation of Environmental Measures Improving Traffic Safety

Environment protection and traffic safety measures:

- net fencing for animals;
- underground passages for wild life;
- ramps;
- etc.





Results of the investigation

- To size up the influence of the implemented traffic safety improving measures upon the accident rate 4 types of traffic safety improving measures were selected. On the sections where the measures were implemented the change of accident rate was estimated, comparing an accident rate situation after the measure was implemented with the former situation.
- For the five measures from the six a positive effect was estimated, i.e. accident rate decreased from 24% to 100%, but when the crossings were reconstructed into traffic-light crossings, accident rate increased 33%.
- The investigation shows that reconstruction of the crossing into roundabout is the most effective measure and for traffic safety and for environment protection.
- From the analyzed measures with a high data amount the biggest effect have the pedestrian-cycling pathways. After the construction of pathways the number of accidents has decreased 81%, and of the killed and wounded people – respectively 94 % and 87 %.
- More safe and comfortable pedestrian/cycle pathways are built less is transport pollution;
- For lightening, speed cameras and etc. solar and wind power can be used;
- Installation of environmental protection measures is possible to reduce traffic accidents.

Alėja Kreizaite, 13 m., Rokiškis, prisainka

THANK YOU

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