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# ***STUDIES ON THE ROADSIDE ENVIRONMENT IMPACT ON ROAD SAFETY***

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# **RISK IN TRANSPORT**

The number of fatalities in the EU countries (15) in particular transport means:

- **Road transport** - **42 500 fatalities**
- Railway transport - 108 fatalities
- Aviation - 190 fatalities
- Shipping - 100 fatalities

(ETSC 1999)

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# ***DANGERS ON ROADS FOR LAST 15 YEARS***

**820 000 road accidents**

**over 1 000 000 injured**

**almost 100 000 fatalities**

**including almost 20 000 killed on 'trees and poles'**

**cost of road incidents over 300 milliard PLN**

**17 % of total number of fatalities, on average 1000 people a year have died as a result of hitting a tree, pole or other road object!**

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# ***ROADSIDE ENVIRONMENT CHARACTERISTICS***

- All road infrastructure devices are located in the immediate vicinity of road verge or in central reservation



- Roadside environment is also trees growing too often close to the road verge

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# ***INFRASTRUCTURE DEVICES***

## **Four major categories:**

- 1. Supporting structures of signs and boards**
- 2. Street lighting and traffic lights poles**
- 3. Restraint systems - road safety barriers**
- 4. Other road infrastructure devices located in the immediate vicinity of road verge or in central reservation**

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# ***RESULTS OF THE VEHICLE COLLISION WITH FIXED SUPPORTING STRUCTURE***



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# SAFE ENVIRONMENT

- **Safe environment (synonyms: ‘passive’, „soft” )** is a driver - friendly environment „forgiving” their mistakes, which are often unintended, and reducing the results of a mistake to the minimum

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# ***PASSIVE ROAD EQUIPMENT***

**According to ETSC:**

- Road restraint system –(*RRS*)
- Energy-absorbing supporting structures
- Anti-crash equipment
- Road shoulder

***Division of road restraint system (RRS):***

- a) RRS for vehicles
- b) RRS for pedestrians.

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# ***ROADSIDE ENVIRONMENT IN RESEARCH STUDIES***

- o UE - RISER „Roadside Infrastructure for Safer European Roads”
- o UE - RANKE SR „Ranking for European Roads Safety”
- o AUTOSTRADOS 2003b
- o USA – AASHTO Roadside Design Guide
- o Great Britain – USE OF PASSIVELY SAFE SIGNPOSTS TO BS EN 12767
- o Finland – VERTICAL SIGN SUPPORT WITH PASSIVE SAFETY
- Norway – TRAFIKKSIKKERHETSUTSTYR FUNKSJONS OG MATERIALKRAV

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# SHAPING SAFE ROADSIDE ENVIRONMENT ACCORDING TO RISER



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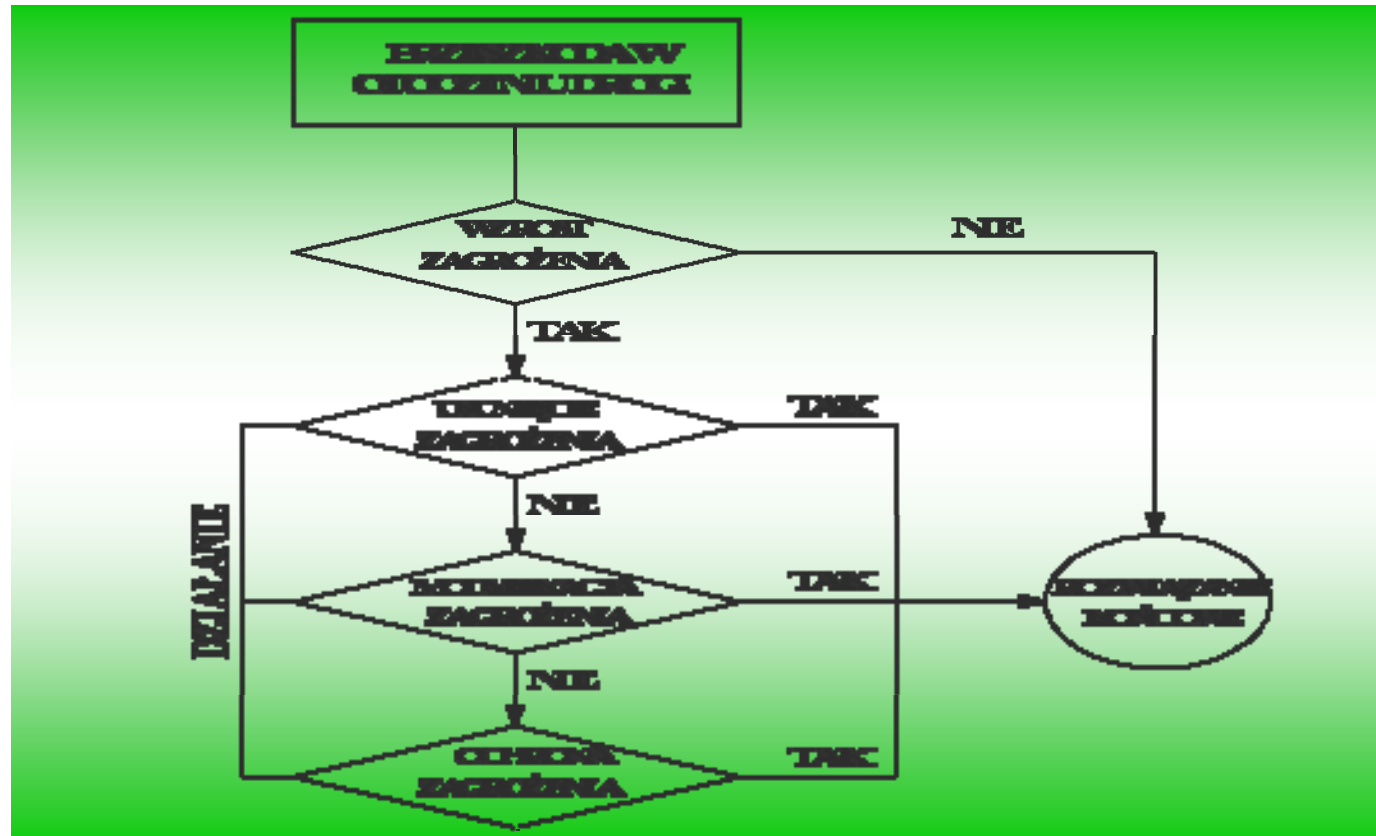


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# THE SCHEME OF ACTION IN ROAD SAFETY PROBLEM SOLVING (RISER)



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# ***GAMBIT 2005 – NATIONAL ROADS***

## **OBJECTIVE 5:**

### **Diminishing the severity and consequences of road accidents**

#### **Priority 5.2. Forgiving roads and safe environment**

- Elimination or isolation of any fixed side obstacles from the road
- Use of flexible supporting structures for traffic signs, and signage

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# ***ROAD INFRASTRUCTURE PASSIVE SAFETY DEVICES***

- **Road safety barriers**
- **Energy-absorbing barriers**
- **Energy-absorbing screens**
- **Safe supporting structures**



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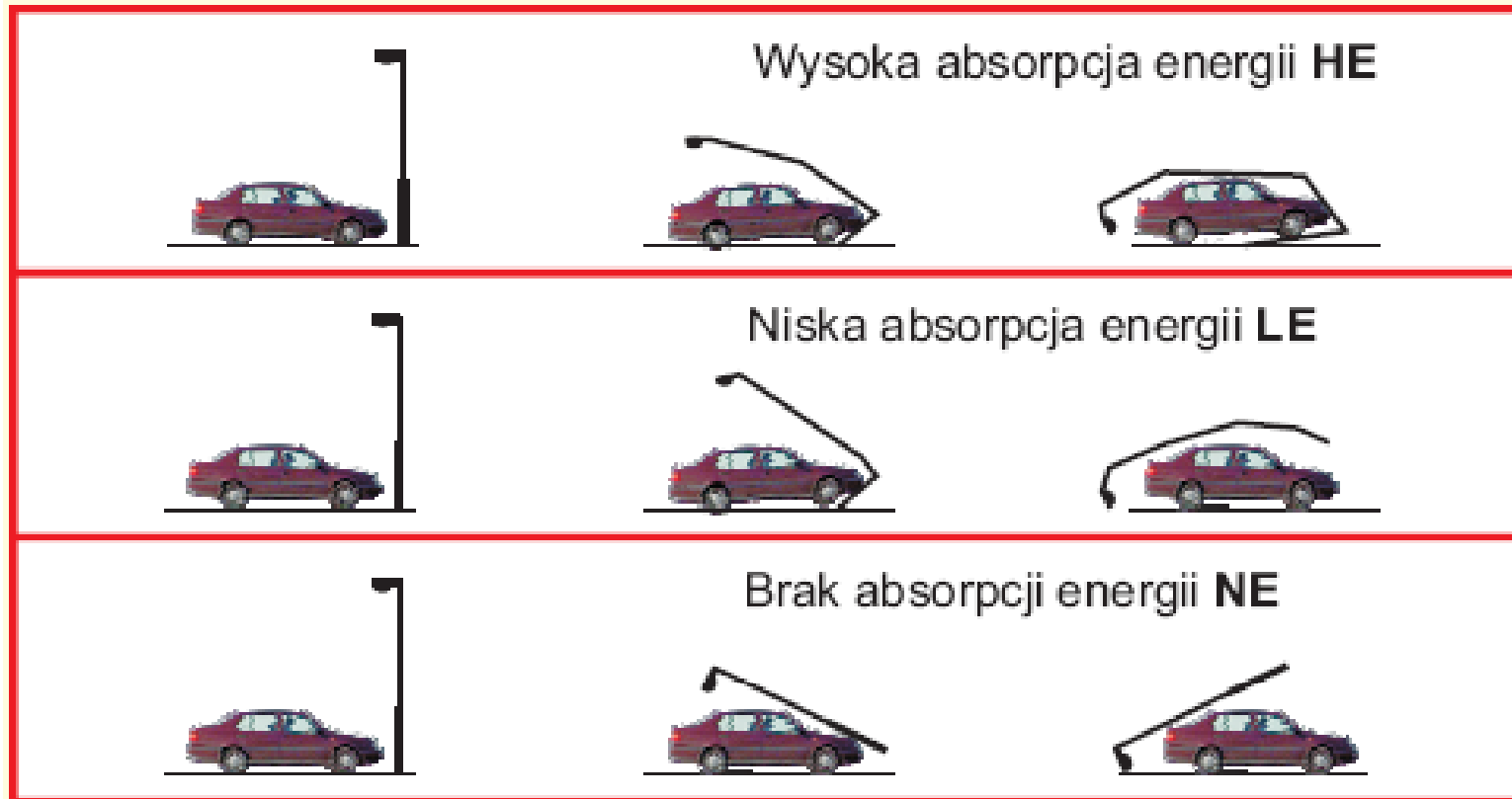


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# ENERGY-ABSORBING STRUCTURES WG PN-EN 12767:2003



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# **ENERGY-ABSORBING STRUCTURES**

## **WG PN-EN 12767:2003**

	Collision speed $v_1$ [km/h]	50	70	100
	Speed after collision $v_e$ [km/h]			
High energy absorption	HE	$v_e = 0$	$0 < v_e \leq 5$	$0 < v_e \leq 50$
Low energy absorption	LE	$0 < v_e \leq 5$	$5 < v_e \leq 30$	$50 < v_e \leq 70$
No energy absorption	NE	$0 < v_e \leq 50$	$50 < v_e \leq 70$	$70 < v_e \leq 100$

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# ***THE CHOICE OF SAFE SUPPORTING STRUCTURES***

## **Factors which should be taken into consideration:**

- Road category and geometry
- Typical vehicle speed
- Presence of other structures, trees or pedestrian traffic
- Predicted risk of injury during accident and the cost of compensation
- Efficiency of vehicle braking system.

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# ***SOME CRITERIA OF THE CHOICE OF PROPER KIND OF STRUCTURES***

***i.e. HE, LE and NE:***

- **HE** - for street lighting poles
- **LE** - for supporting poles of road signage
- **NE** – in built-up area of low traffic volume and outside built-up area where the speed limit is over 70 km/h.

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# CONCLUSIONS

- Development of the implementation system of passive safety constructions on Polish roads based on norm PN-EN 12767
- Development of regulations related to the mandatory use of passive safety supporting structures in new road investments or on modernized roads
- Introduction of the road supporting structures safety assessment into the analysis of the causes and results of road accidents
- Distinction between collisions with trees and supporting structures in the analysis accidents statistic

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# CONCLUSIONS

- Identification of spot and linear risks on road shoulder, their validation and identification of the measures of risk reduction
- Trainings for road administration on assumptions and objectives of EN 12767 norm and the aspects of the use of devices complying the passive road safety parameters
- Appointing scientific research units, entitled to certify devices in regard of structures compatibility with EN-12767 norm or adopting the system of validation of the certificates issued in other countries
- Development of the criteria of offer assessment in tenders regarding road safety.

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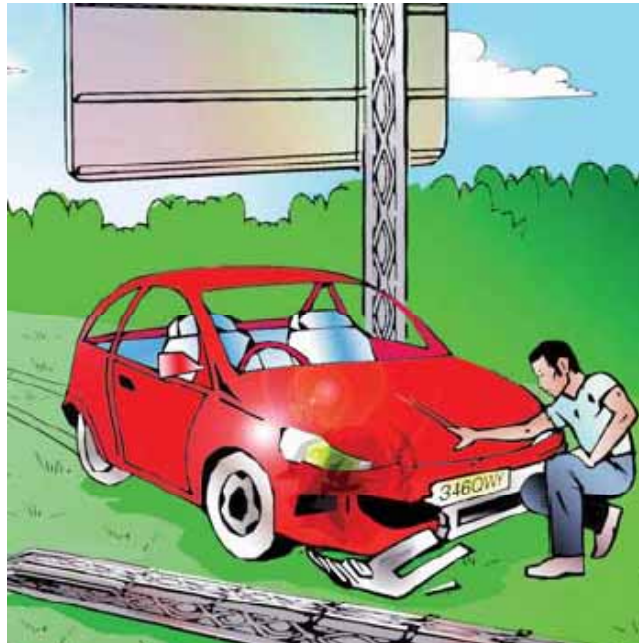
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***THANK YOU FOR YOUR ATTENTION***

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