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SPEED MANAGEMENT AS THE KEY ROAD SAFETY IMPROVEMENT MEASURE ON NATIONAL ROADS

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- **Speed as an important factor of accident occurrence – accidents data and model analyses**
- **Conclusions from systematic speed studies**
- **Strategy of speed management implementation**
- **Automatic control as one of the speed management measures**

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The influence of speed on road safety – the analysis of national roads accidents data

- **26%** of accident causes are related to the excessive speed
- about **27%** of fatalities in the accidents caused by excessive speed
- about **22%** fatalities in accidents caused by wrong manoeuvring and failure to keep sufficient distance
- Severity of accidents related to excessive speed: **17.9 fatalities/100 accidents** during a day and **23.3 fatalities /100 accidents** at night
- Pedestrians constitute **29%** in the total number of fatalities in road accidents
- Regional diversity of the share of accidents with direct and indirect influence of excessive speed - (**47 ÷ 77%**)

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The influence of speed on road safety – the results of researches and analyses of regression

- **Speed is connected with the complex of factors which determine road safety – their quantity influence in the models of accidents prediction may be expressed directly by different factors**
- **The influence of speed on road safety is closely connected with the technical standard of roads and intersections and the roadside environment management**
- **Apart from excessive speed the crucial cause of accident is heterogeneity of vehicles velocity in traffic flows**
- **The pedestrians and cyclists – the group particularly endangered with excessive speed accidents**

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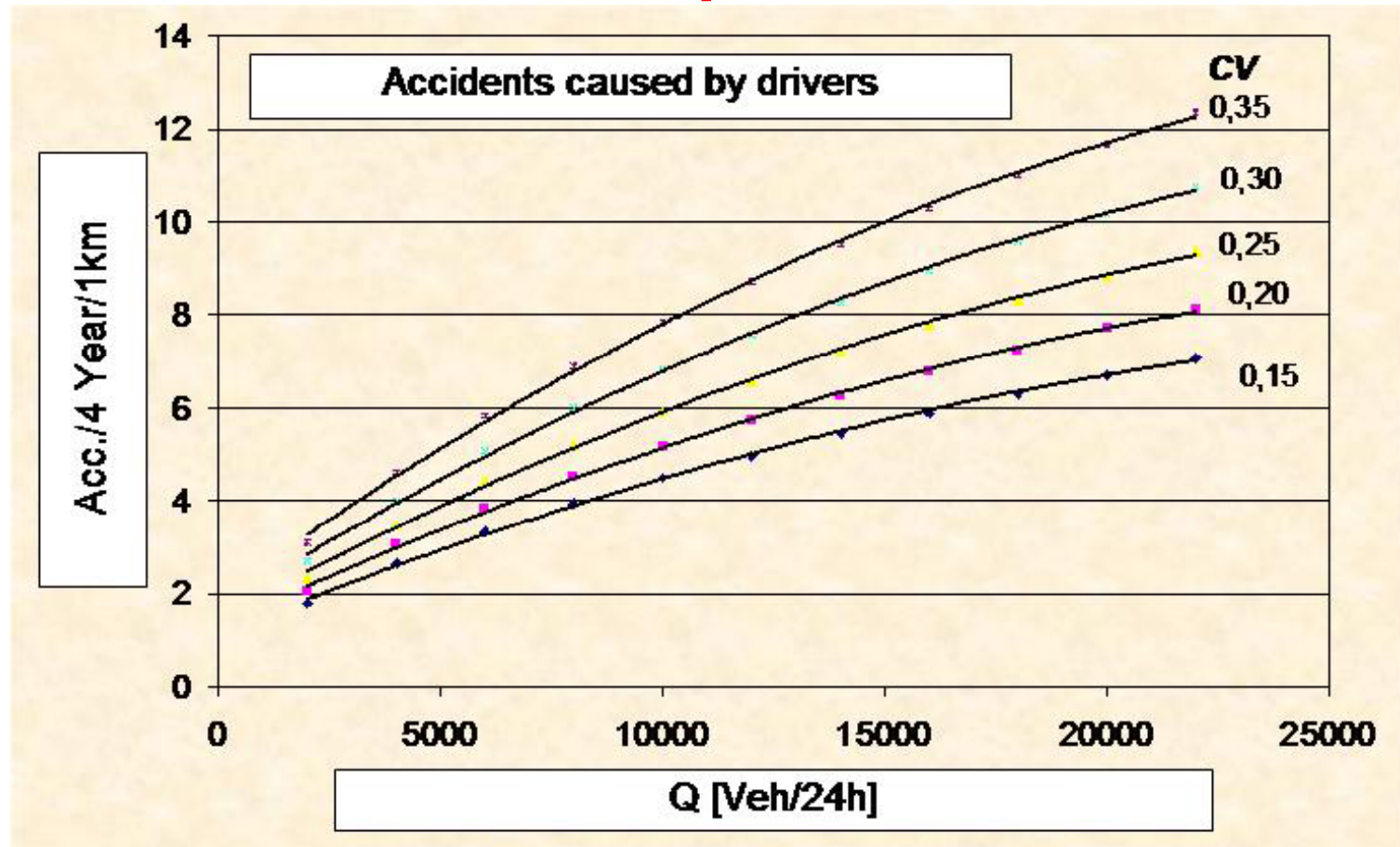


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The examples of regression models of accident prediction



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Do the speed studies prove its potential impact on road safety?



Source of speed data:

Commissioned by KRBRD periodical, 24-hour studies from 2002 (32 stationary measurement stations and 16 of mobile location) – 26 series of studies conducted

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Aggregated results of speed studies

Average 24-hour values

Section location	Cross-section type	Speed parametres		
		V_A [km/h]	V_{85} [km/h]	PV [%]
Built-up areas	Z1	78,4 (69,1 ÷ 86,2)	93,9 (81,7 ÷ 105,0)	94,0 (79,7 ÷ 98,1)
	Z2	71,8 (64,4 ÷ 78,4)	86,3 (78,0 ÷ 94)	88,2 (77,8 ÷ 97,2)
	M3	63,9 (47,6 ÷ 77,7)	77,4 (58,0 ÷ 94,0)	71,3 (38,3 ÷ 92,2)
Outside built-up areas	Z1	86,2 (80,3 ÷ 100,3)	105,8 (98,0 ÷ 124,0)	54,3 (41,6 ÷ 81,8)
	Z2	84,7 (80,8 ÷ 90,4)	102,1 (97,0 ÷ 107,0)	49,4 (37,6 ÷ 59,0)
	Z2+D	85,8 (78,8 ÷ 89,8)	104,0 (95,0 ÷ 111,0)	52,8 (30,8 ÷ 66,4)
	Z3	85,1 (79,3 ÷ 93,1)	103,7 (96,0 ÷ 115,0)	47,6 (37,8 ÷ 65,6)

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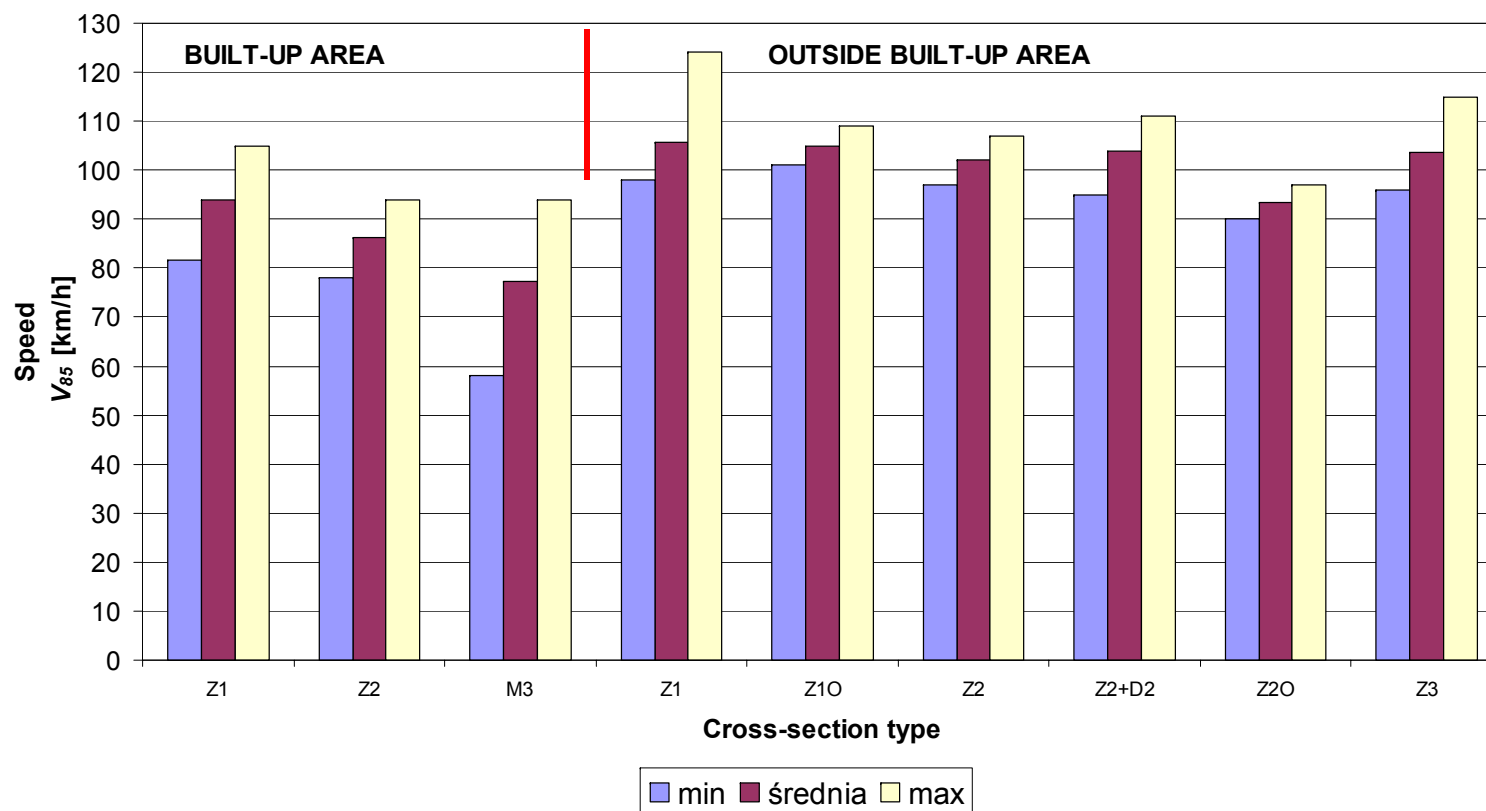
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Aggregated results of speed studies

Average 24-hour values of speed Quantile V_{85}



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The assessment of speed limit reduction in built-up area in 2004

Studies results „before” and „after” between
5:00 and 23:00

	Cross-sections Z1		Cross-sections Z2		Cross-sections M3	
Parameter	V_A [km/h]	V_{85} [km/h]	V_A [km/h]	V_{85} [km/h]	V_A [km/h]	V_{85} [km/h]
„Before”	81,87	97,38	75,28	89,13	67,52	80,04
„After”	79,7	94,16	71,99	83,76	65,87	78,17
Difference	-2,17	-3,22	-3,29	-5,37	-1,65	-1,87

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The needs and strategy of speed management implementation

The studies results indicate the significant potential of road safety improvement through the speed management including:

- a) Introduction of general and local speed limits
- b) Implementation of general and local speed limits
- c) Enforcement of speed limits

Priorities

- Development of hierarchical road network with various speed limits
- Elaboration of the rules of speed limit usage with the practice of variable speed limits use
- Verification of existing local speed limits

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Priorities:

- Identification of sections which require local speed limits, including variable value limits
- Use of road signs and markings depending on the level of threat to road safety
- Implementation of physical measures of speed reduction in built-up areas
- **Automatic traffic supervision - speed control**
- Conducting information campaigns about carried out actions and studies of implemented measures efficiency

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Conditions of speed management implementation

- **Appointing interdisciplinary coordination team**
- **Identification of institutional and legislative obstacles**
- **Selection of measures which are efficient in Polish conditions**
- **Updating the regulations of road planning and designing**
- **Training for road administration personnel as well as for planners and designers**
- **Coordination of implemented engineering measures with educational and informative activities**

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Automatic control as one of the speed management measures

The procedure of road section choice for speed control

- Identification of the roads with accident density significantly different from the average
- Identification of the sections of selected roads with the accident indicators exceeding the accepted boundary values
- Boundary values of accident indicators established with regional diversity for individual Divisions of GDDKiA (General Directorate for National Roads and Motorways)

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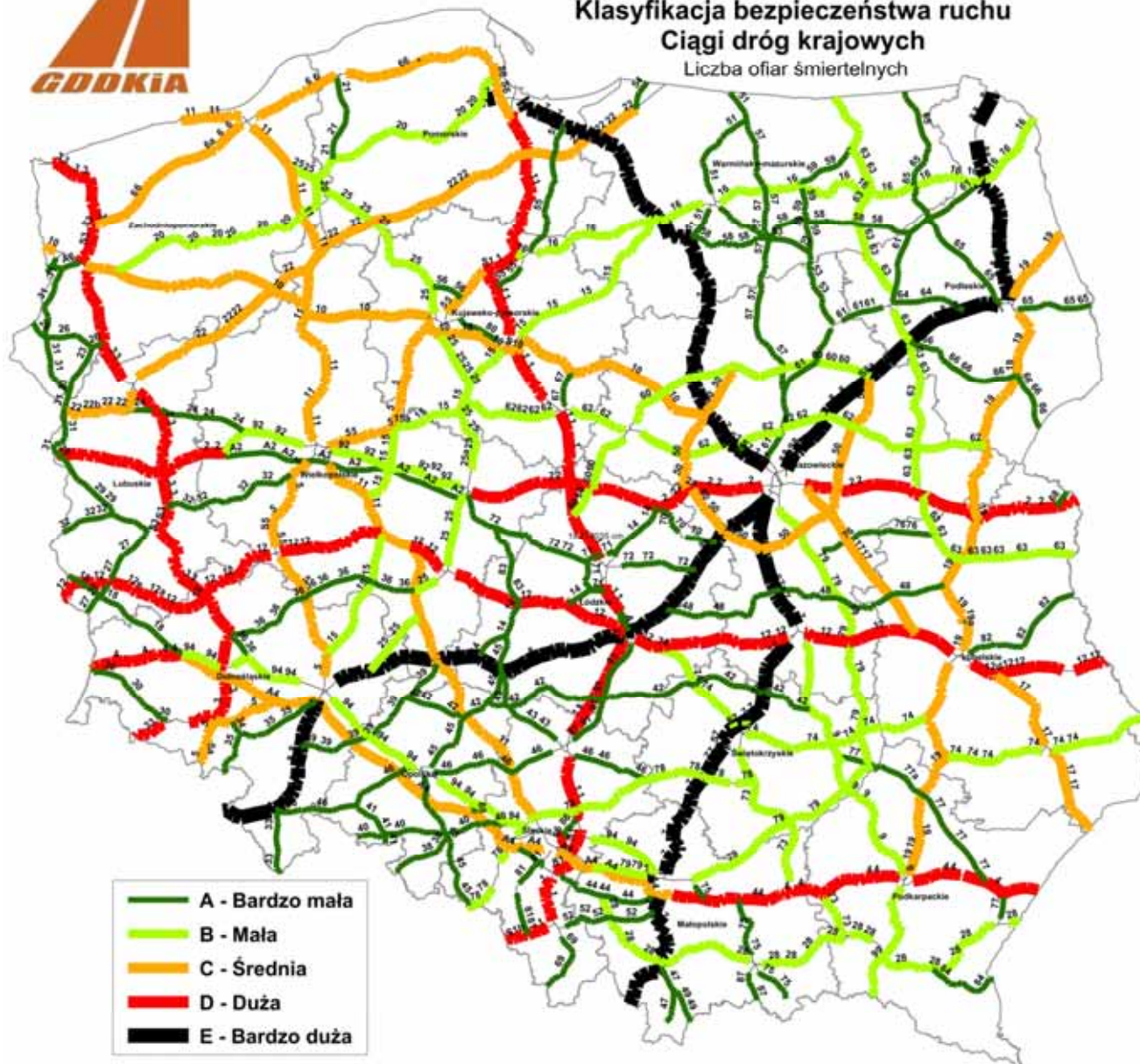
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Drogi Krajowe 2001 - 2005
Prędkość
Klasyfikacja bezpieczeństwa ruchu
Ciągi dróg krajowych
Liczba ofiar śmiertelnych



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The procedure of road section choice for speed control

- Preparation of the initial list of accident concentration sections
- On-site verification and pointing the exact location of speed cameras
- Preparation of list of speed cameras locations on the basis of accident victims reduction potential
- Completing the list with special locations
- Linking the speed cameras implementation with the programme „GAMBIT – NATIONAL ROADS”

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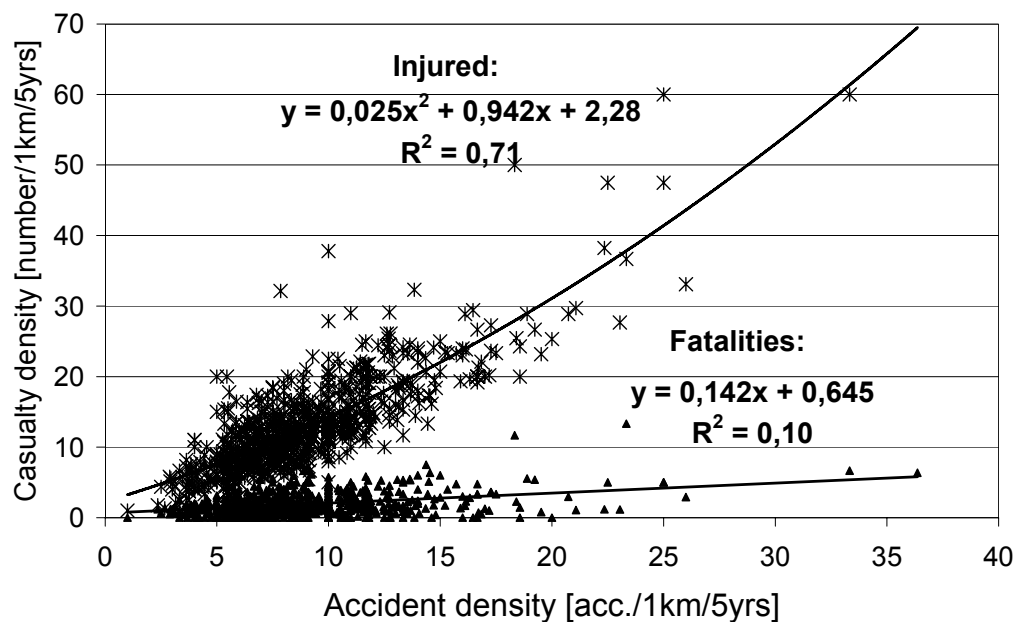


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Accidents on roads 1 - 12

	All sections	Critical sections	Percent of critical sections
Length [km]	5721	984	17.2%
Injuries	33299/ 21264	18139/ 10419	54,5/ 49.3%
Fatalities	5264/ 3081	2427/ 1374	46,1/ 44.6%

Victims in all accidents/**victms in speed-related accidents**



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Planned speed-cameras on roads 1 ÷ 9 Predictions

Road number/number of speed-cameras									Total
DK1	DK2	DK3	DK4	DK5	DK6	DK7	DK8	DK9	
80	72	62	60	72	34	71	97	27	575

Road number	Reduction of accidents and victims during 5 years		
	Accidents	Injured	Casualties
1	299	493	127
2	185	308	124
3	113	201	62
4	187	312	87
5	142	253	64
6	89	136	35
7	309	513	139
8	300	494	170
9	77	117	34
Total	1701	2827	842

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Drogi Krajowe Lokalizacja Fotoradarów



DK1 ÷ DK9

Legenda:



Lokalizacja fotoradarów

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Conclusions – conditions for success

- It is necessary to implement comprehensively the elements of speed management considering the indicated priorities
- Development of automatic speed control requires to improve formal procedures and penalties enforcement
- Planned network of speed cameras may cover about 20% of selected road network and cannot be the only safety improvement measure
- Simultaneous, intense informative and educational activities are necessary



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Thank you for your attention

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