



**2017 ANNUAL POLIS  
CONFERENCE**  
6-7 December 2017, Brussels  
Innovation in Transport for Sustainable Cities and Regions



# Low Danger Zone (LDZ) Improving road safety and air quality

Pierre Courbe  
Fédération Inter-Environnement Wallonie

Koen Van Wonterghem  
OVK-PEVR



Brussels – POLIS Conference - 07 December 2017



# TRAFFIC & VICTIMS

## Road victims

BE 2015: 732 killed, 4.201 seriously injured and 47.638 slightly injured

EU 28: 25,670 killed (2016), 135,000 seriously injured (2014)

## Traffic noise victims

EU: 10.000 => BE 220 (indicative figures)

## Traffic victims due to air pollution

	PM <sub>2.5</sub>	NO <sub>x</sub>	O <sub>3</sub>	Total
Premature deaths in BE in 2013	10.050	2.320	210	12.580
Traffic emissions in 2012	13 %	49 %	?	/
Traffic induced deaths	1.307	1.137	?	2.444

Indicative figures – surely underestimated, due do the fact that:

- traffic's share is more important in urban areas
- road emissions occur close to respiratory tract



# TRAFFIC MANAGEMENT IN CITIES

## Traffic impacts in cities

Air pollution, road unsafety, noise, public space occupancy, loss of conviviality

## Solutions to reduce these impacts

	Air quality	Road safety	Quietude	Public space
Walking and cycling	☺☺☺	☺☺☺	☺☺☺	☺☺☺
Public transports	☺☺	☺☺	☺	☺☺☺
Electric cars	☺☺☺		☺☺(☺)	
30 km/h / shared space ...	☺(☺)	☺☺	☺☺	☺(☺)
Low emissions zones	☺☺			

- **Low danger zones**

# LEZ & AIR QUALITY

## Good results...

Berlin LEZ impacts (\*)

- Traffic emissions down -60% (PM) & -20% (NO<sub>x</sub>) on top of BAU trend
- Air quality up: -5 to 10% PM10/2.5 & NO<sub>2</sub>

## ...But not so good as theory

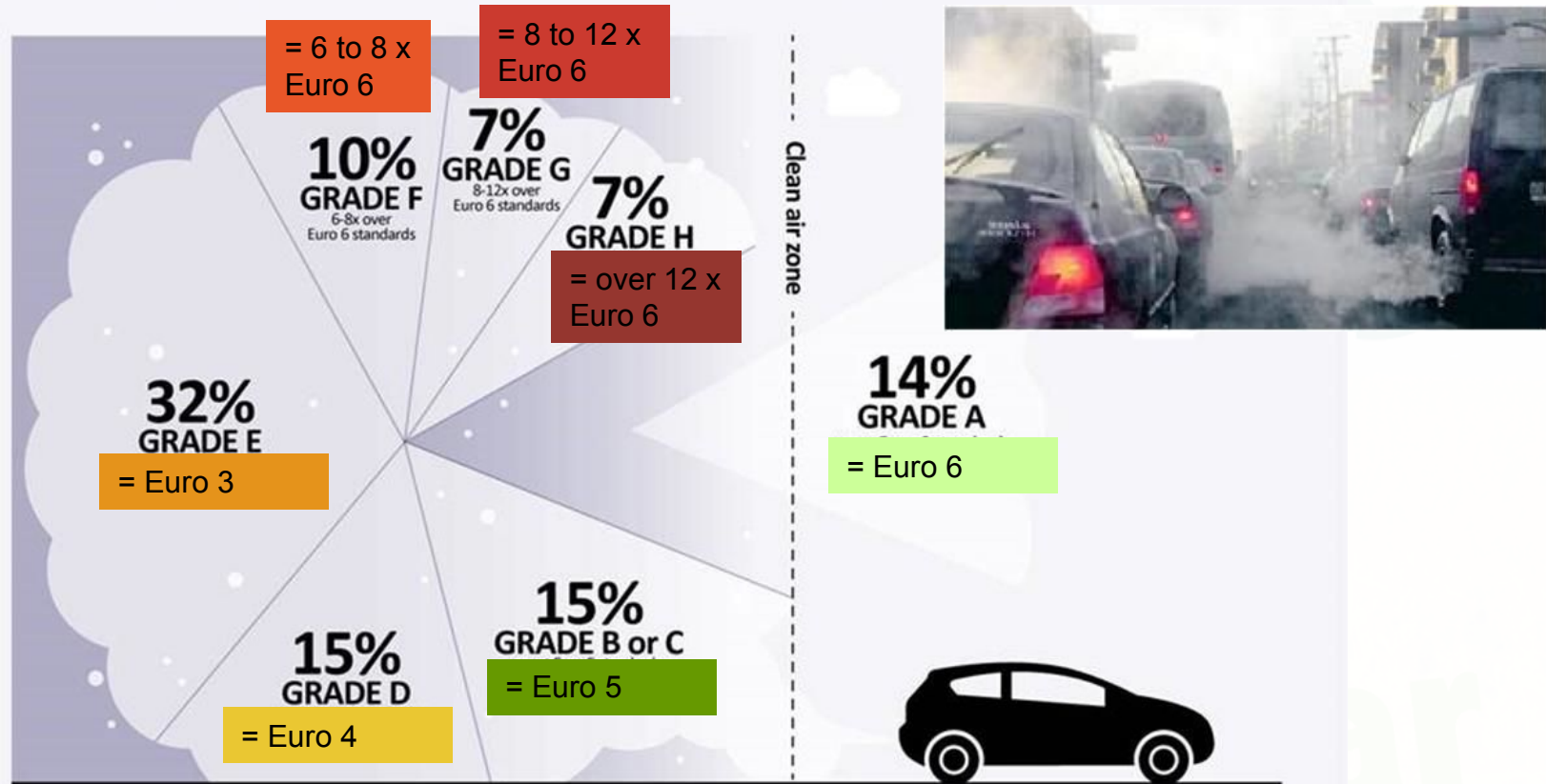
Two factors:

- unreliability of the official (type-approved) emissions
- adverse effect of new technologies as direct injection applied to petrol engines

(\*) LUTZ M. 2012. *Abatement of PM and NO<sub>2</sub> pollution in Berlin: The low emission zone and other measures*

# EURO NORMS: UNRELIABLE

**Clean Air Zones permitting entry to Euro 6 diesels**  
will see 86% of cars emitting above the NO<sub>x</sub> standard in real-world driving



**EQUA**<sup>™</sup>  
INDEX

POWERED BY  
EMISSIONS ANALYTICS

Source : Emissions Analytics, 2017

# LEZ ADVERSE EFFECTS

## VW Polo 1.4 TDi (2005)

Price: 3 700 € (2<sup>nd</sup> hand)

Mass: 1 091 kg

Power: 51 kW / 70 Hp

CO<sub>2</sub>: 136 g/km (est.)

Euro norm: 4

NO<sub>x</sub>: 0,80 g/km (est.)



**FORBIDDEN**

## Ssangyong Korando SE (2016)

Price: 25 500 €

Mass: 1 597 kg

Power: 131 kW / 178 Hp

CO<sub>2</sub>: 175-200 g/km (on road\*)

Euro norm: 6

NO<sub>x</sub>: min. 0.96 g/km (on road\*)



**ALLOWED**

# WHAT THEN?

**Lisa Car**

Light and **SAFE** Car

**Tomorrow's car**

[www.lisacar.eu](http://www.lisacar.eu)

**iew**

OVK - PEVR

# MASS, POWER & SAFETY

**The segmentation groups used for the third party liability insurances are intimately correlated to the maximum kinetic energy (so to the power) of the vehicles**

- AXA states that *“the statistics establish that the more powerful a car, the higher the frequency and the seriousness of the accidents.”*
- Partner clearly makes the link between the vehicle and the behavior: *“the characteristics of the vehicle (make, type, power, sporty character, body, ...) make it possible to predict the behavior of the driver and the potential dangerousness of the vehicle; both influencing the seriousness of the crashes.”*



# MASS, POWER & SAFETY

**HORSWILL M. S., COSTER M. E. 2002. The effect of vehicle characteristics on drivers' risk-taking behaviour. Ergonomics, 45:2, p. 85-104**

*“Results indicate that the causal mechanism behind the relationship [between vehicle performance and drivers’ risk-taking behaviour] is bi-directional , such that while drivers who take more risks choose faster cars, vehicle performance also influences drivers’ risk-taking intentions.”*

## The phone booth experiment



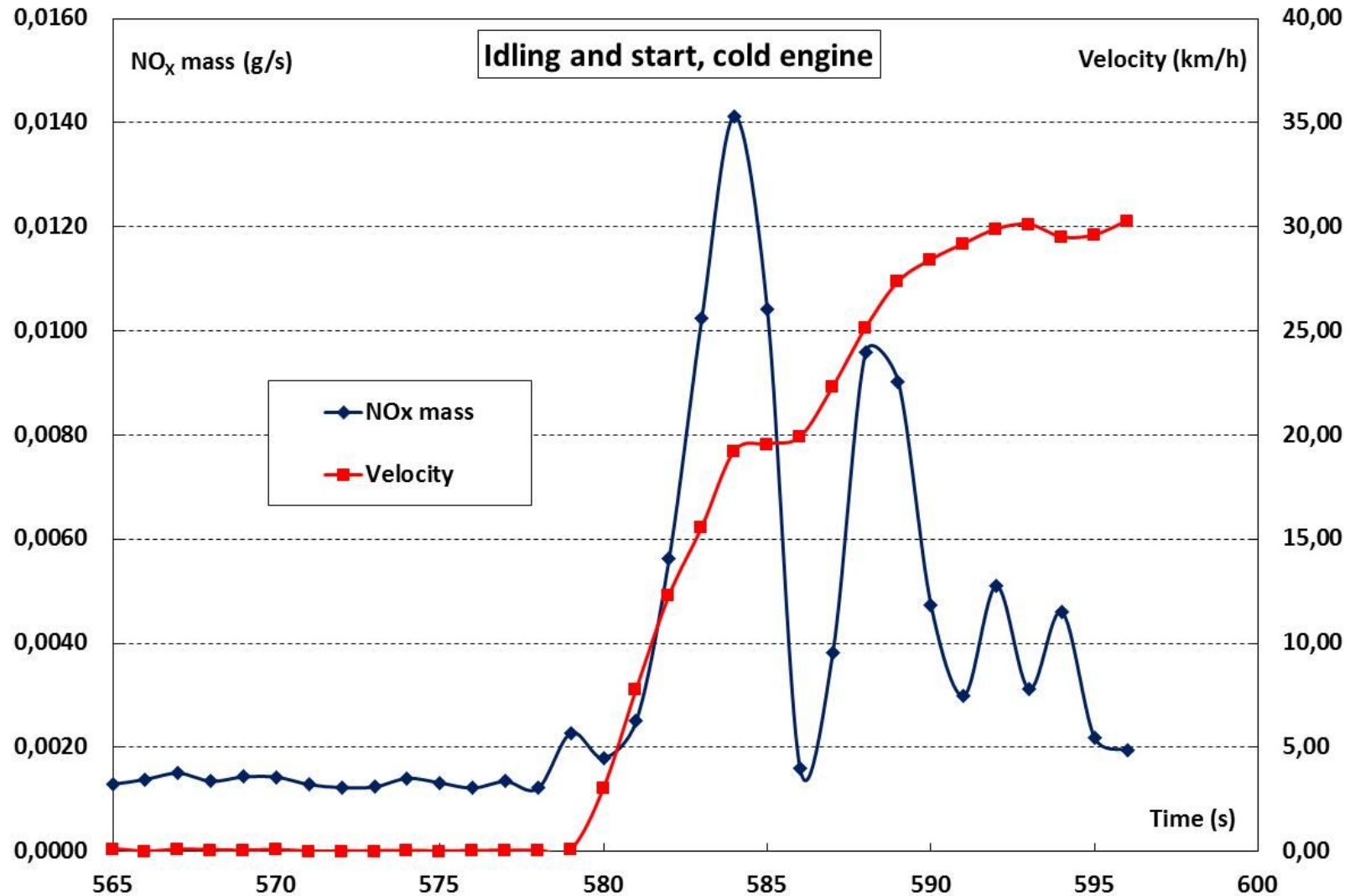
# MASS, POWER & ENERGY

## Characteristics and fuel consumption of petrol VW Golf VII

Version	1	2	Increase 1->2
Power (kW)	62	221	+ 256 %
Mass (kg)	1,130	1,401	+ 24 %
Top speed (km/h)	179	250	+ 38 %
NEDC <b>Urban</b> (l/100 km)	6.1	9.4	<b>+ 54 %</b>
NEDC average (l/100 km)	4.9	7.1	+ 45 %

# POWER & POLLUTION

RDE test, vehicle \*\*\*\*\*



# CAR MARKET TRENDS



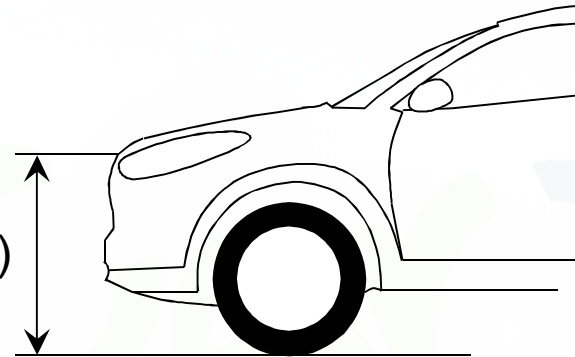
## New cars sales in BE

	2001	2016	Evolution
Small hatchbacks	111,276	16,775	- 84.9%
Medium family cars	66,034	35,601	- 46.1%
Big monospaces	23,803	34,807	+ 46.2%
<b>Jeeplikes</b>	13,490	146,563	<b>+ 986.5%</b>

# LOW DANGER ZONE (LDZ): THE CONCEPT

## Limit urban access on basis of:

- Mass
- Power
- (and bonnet leading edge height - BLEH?)



## Frontrunners

MOMCILOVIC V., VUJANOVIC D., PAPIC V. 2009. Small urban vehicles: a solution for increasing energy efficiency and decreasing CO2 emissions within city limits.

WIT Transactions on The Built Environment, Vol 107, p. 479-489

- *The main idea behind this paper is to impose restrictions on private cars' admittance to restricted areas due to their "weight efficiency".*
- *The objective [...] is to influence the users' awareness, impose moral principles, that the purchase of an inefficient, excessively "overweight" vehicle has a wide negative impact on an entire society and on environmental protection.*

# WHY LDZ?

## **Reliability of data**

- Mass (weight) and power are not cheated
- Nor Bonnet leading edge height

## **Answer to 3 problems**

- Air pollution, road unsafety, noise
- Bonus: public space, conviviality

## **Social equity**

- in a LEZ, only new cars can be driven
- in a LDZ, also older cars that are owned by the poorest

## **Drive automobile sector in the good direction**

- There are norms for air pollution – not for mass, power and aggressiveness of cars' front
- LDVs can palliate this

# CALL FOR PUBLIC ACTION

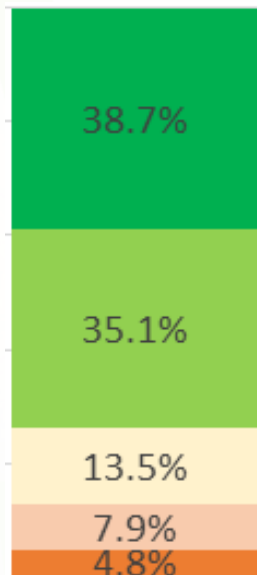
## Political action is awaited for a long time

ECMT called for action to limit cars power in 1991, 26 years ago!

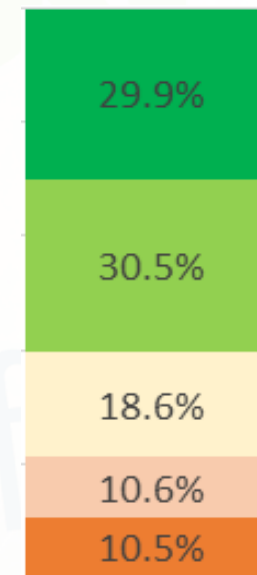
## Public opinion is ready

Results of an opinion poll conducted in Wallonia by AWSR in 2016 (\*)

### Some cars induce speeding because they are too powerful



### There should be laws to limit cars power



- Completely agree
- Rather agree
- Neutral
- Rather disagree
- Completely disagree

# BEYOND LDZs

## **Parking**

- Special rates for LISA Cars
- Reserved places for smaller cars
- Car sharing: support from community related to the size of the vehicles
- Residents' parking permit related to vehicle size

## **Taxation**

- Regional/national level: registration taxes based on mass and power



# To CONCLUDE:

## TRAFFIC MANAGEMENT IN CITIES

### Traffic impacts in cities

Air pollution, road unsafety, noise, public space occupancy, loss of conviviality

### Solutions to answer these problems

	Air quality	Road safety	Quietude	Public space
Walking and cycling	☺☺☺	☺☺☺	☺☺☺	☺☺☺
Public transports	☺☺	☺☺	☺	☺☺☺
Electric cars	☺☺☺		☺☺(☺)	
30 km/h / shared space ...	☺(☺)	☺☺	☺☺	☺(☺)
Low emissions zones	☺☺			
Low danger zones	☺☺	☺☺	☺☺	☺

Thank you!



[www.iew.be](http://www.iew.be)

[www.ovk.be](http://www.ovk.be)

[www.lisacar.eu](http://www.lisacar.eu)

