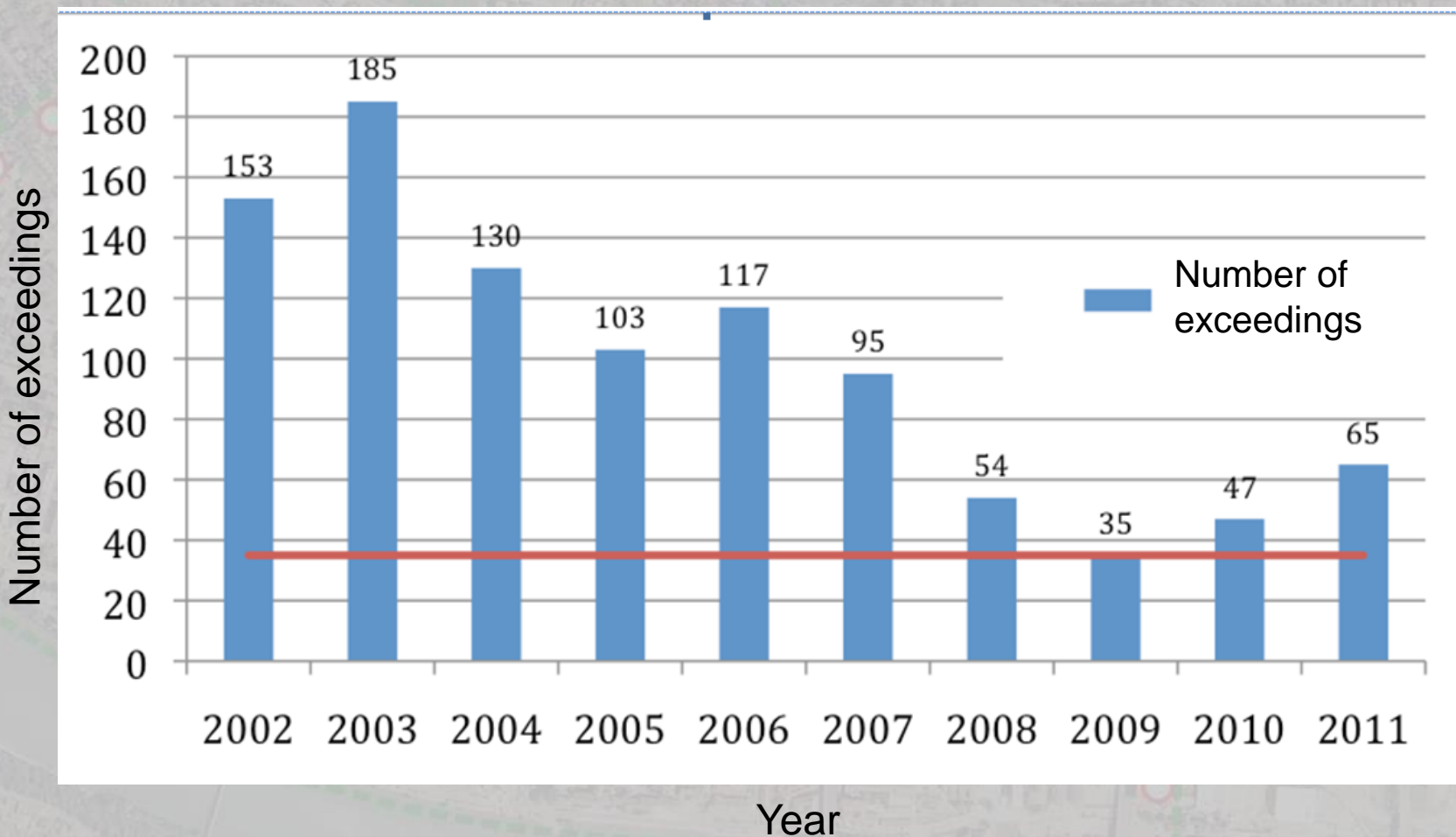


LOW EMISSION ZONE IN MARIBOR

University of Maribor: Marjan Lep, Marko Čelan, Marko Renčelj, Branka Trček

Maribor, 19.9.2013

The problem in 2011: Exceeding of PM10 - daily limit value (measuring point "Center")



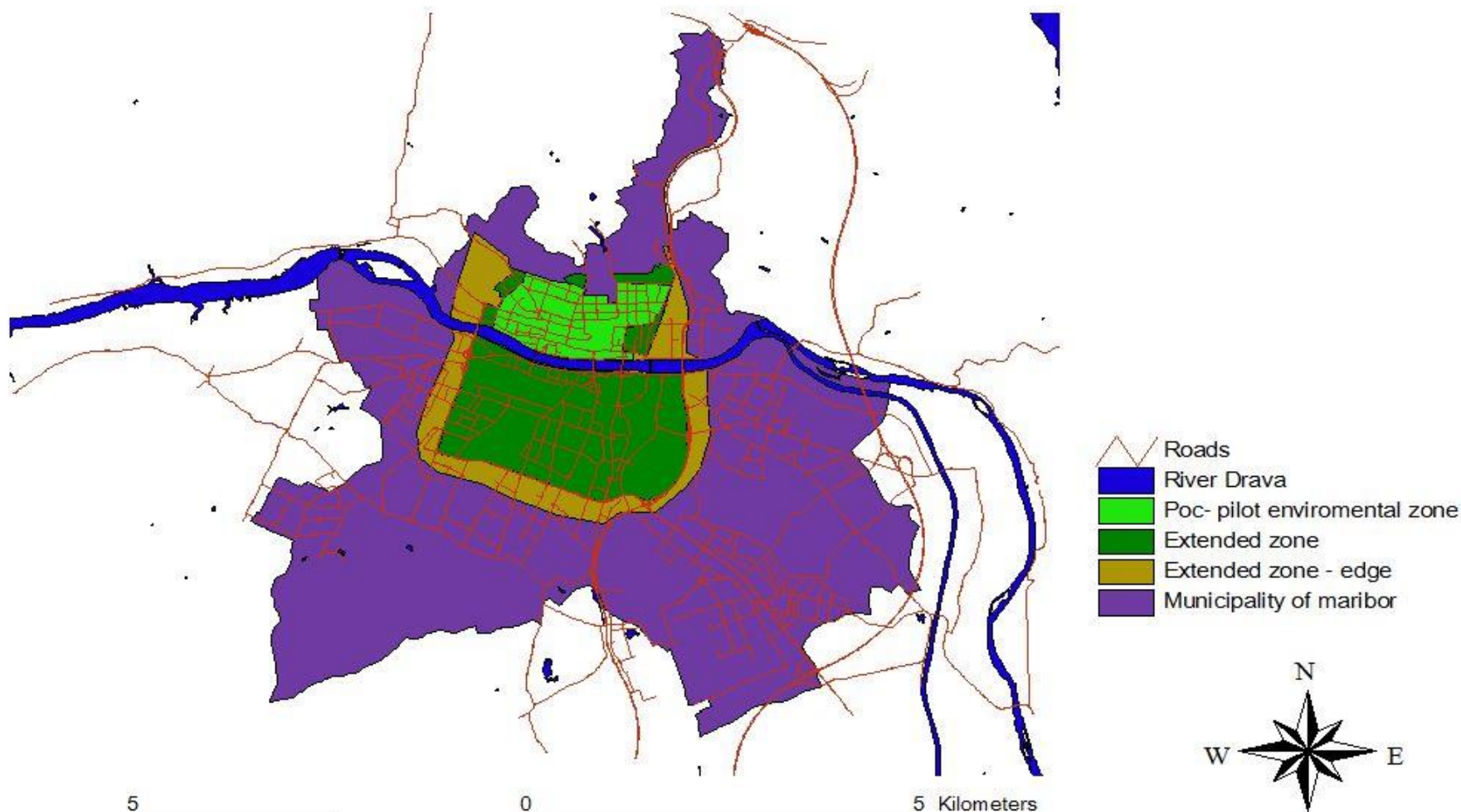
Approaches ?

“Operational program to protect ambient air from PM_{10} pollution”:






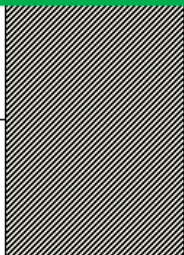


Measures foreseen to decrease PM_{10} pollution from road traffic (listed):

- *P&R system*
- *Improving of PT supply, included PT vehicles*
- *Restrictions for HDV with “low” euro standard engine*
- *Speed limit*
- *Low emission zones in urban areas*

Area of Municipality of Maribor



Low emission zone – restrictions and foreseen extensions

Time frame		Area	Vehicle/prohibition				Weekly	Time windows		
Phases	Time restrictions						✓ ... allowed x ... prohibition	Vehicles - residents	Delivery vehicles	
Phase 1	1.10.2012 – 30.4.2012		EURO 0	EURO 0	EURO 0		Mon x Tue x Wed x Thu x Fri x Sat ✓ Sun ✓	Every day (permit)	Mon – Fri 5.00 – 7.00 20.00 – 22.00	
			EURO 1	EURO 1	EURO I					
Evalvation(1.10.2012 – 30.9.2013) and preparation of the decree of low emission zone										
Phase 2	1.10.2013 – 30.4.2014		EURO 0	EURO 0	EURO 0	EURO 0	Mon x Tue x Wed x Thu x Fri x Sat ✓ Sun ✓	Every day (permit)	Mon – Fri 5.00 – 7.00 20.00 – 22.00	
			EURO 1	EURO 1	EURO I	EURO I				
			EURO 2	EURO 2	EURO II	EURO II				
Phase 3	1.10.2014 – 30.9.2015		EURO 0	EURO 0	EURO 0	EURO 0	Mon x Tue x Wed x Thu x Fri x Sat x Sun x	No exception		
			EURO 1	EURO 1	EURO I	EURO I				
			EURO 2	EURO 2	EURO II	EURO II				
			EURO 3	EURO 3	EURO III	EURO III				



Advance warning traffic signs to announce POC



Restrictive traffic signs



Personal cars, LDV – before 1997
HDV – before 1.10.1996

Exceptions

Disabled people

Emergency vehicle

Oldtimers

Service vehicle, mobility machinery

Delivery vehicles (5.00-9.00, 20.00-22.00)

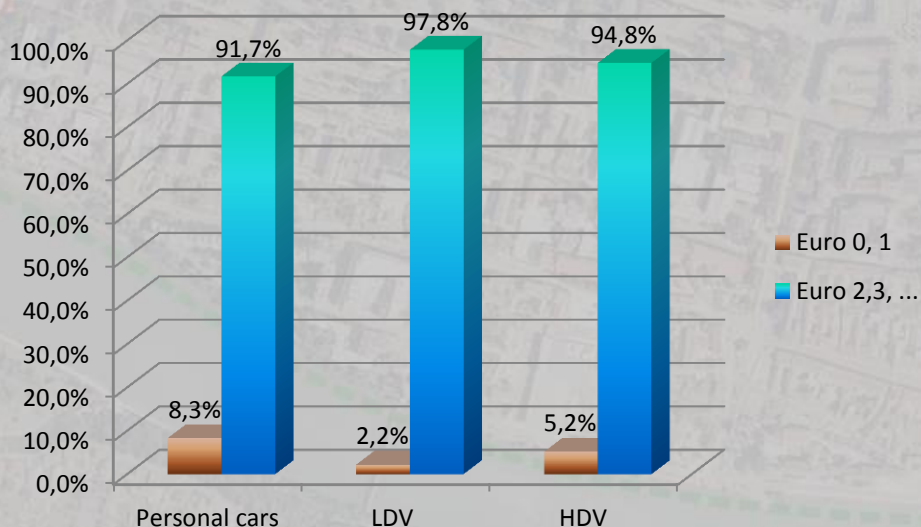
Residents

... etc.

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Affected residents (exeption)

Vehicle	Personal car	LDV	HDV
EURO standard	EURO 0, EURO 1	EURO 0, EURO 1	EURO 0, EURO I
Number	975	42	27



EURO Standard	Personal car	LDV	HDV
EURO 0	354	7	14
EURO 1 or I	621	35	13
EURO 2 or II	2049	90	107
EURO 3 or III	4222	514	98
EURO 4 or IV	2752	807	237
Newer	1770	498	53

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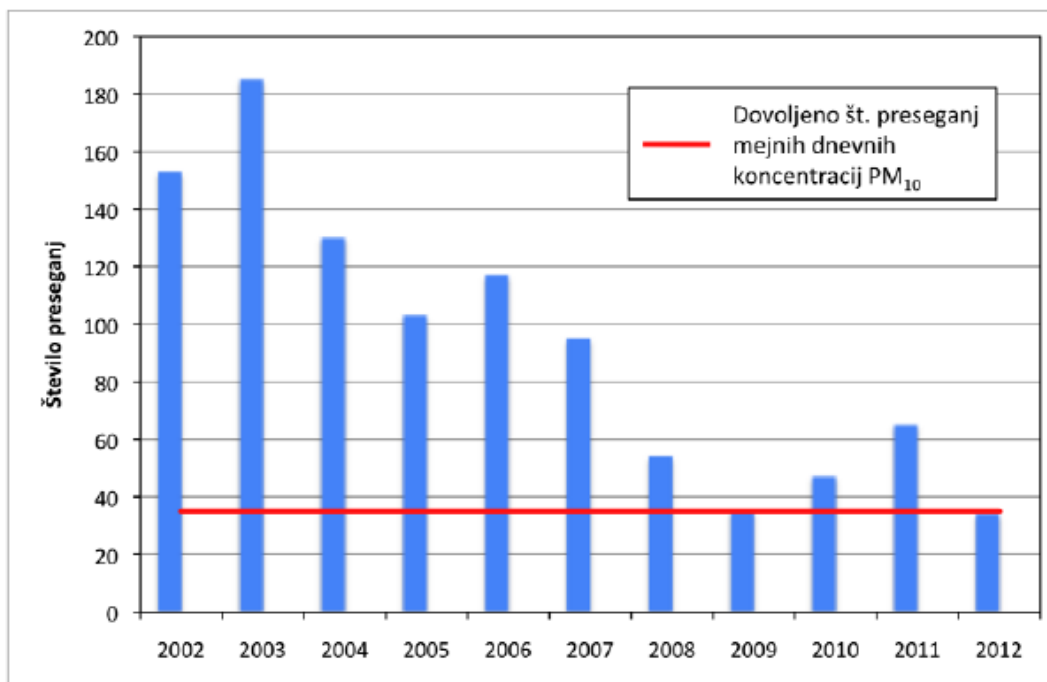
Weaknesses ..

Various problems:

- i) The measure affect only certain group of travelers – discriminatory (! Ombudsman)
- ii) Small impact on the general air quality
- iii) Business entities claiming loss of businesses
- iv) Euro standards (? Stickers) and Enforcement
- v) No accompanying pull measures (P&R, PT improv., incentives)

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POC Monitoring



! Decrease of driven veh-km in POC:

- Depopulation/ageing, loss of working places/unemployment, decrease of GDP
- Level of motorization, costs of fuel
- Legislation (compensations for commuters, new tariff for students ...)
- ? POC

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Lesson learned (answ. to weaknesses ...)

Business entities claiming loss of businesses ?

?

Euro standards not clear for users (and enforcement)...

! Stickers on national/EU level

! If the threshold is raised to EURO 3

Enforcement ...

! Amendments to legislation appreciated

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Lesson learned (answ. to weaknesses ...)

No accompanying pull measures (P&R, PT, incentives) ?

- ! Crucial task; without accompanying pull measures, there is no acceptance for LEZ

Discrimination ?

- ! Strong correlation: social status vs. car ownership
- ! Other non-discriminatory measures (30km/h, 50km/h, shared space, ...)

Maribor, 27 September 2013

Lesson learned (answ. to weaknesses ...)

Small impact on air quality ?

Three scenarios were developed to show the needed level of measures and restrictions to achieve significant improvements of air quality goals

+

! Enforcement needed

! Less exceptions

Maribor, 27 September 2013

Conservative scenario, measures and impact, prognosis (Maribor, 2014)



Area	Restriction	Vehicle/km change	PM10 decreasing (HBEFA methodology)
Pilot enviromental zone (POC)	Euro 0,1,2	-15 % (PC, LDV) + 15 % (Public transport)	-23,91%
Extended zone (OC)	Euro 0,1,2	-15 % (PC, LDV) + 15 % (Public transport)	-23,91%
Extended zone – edge	None	+2 % (PC, LDV) + 15 % (Public transport)	-4,52%
Other part of Municipality of Maribor	None	+ 15 % (Public transport)	-6,25%
Municipality of Maribor		-3 % (PC) -2,2 % (LDV) +15% (Public transport)	-9,78%

Active scenario, measures and impact, prognosis (Maribor, 2015)

Area	Restriction	Vehicle/km change	PM10 decreasing (HBEFA methodology)
Pilot enviromental zone (POC)	Euro 0,1,2	-50 % (PC) -15 % (LDV) + 30 % (Public transport)	-59,71%
Extended zone (OC)	Euro 0,1,2	-30 % (PC) -15 % (LDV) + 30 % (Public transport)	-48,81%
Extended zone – edge	None	-7 % (PC, LDV) + 30 % (Public transport)	-15,13%
Other part of Municipality of Maribor	None	30 % (PC) + 30 % (Public transport)	-25,33%
Municipality of Maribor		-17,4 % (PC) -2,7 % (LDV) +30% (Public transport)	-28,55%

Optimistic scenario, measures and impact, prognosis (Maribor, 2016)

Area	Restriction	Vehicle/km change	PM10 decreasing (HBEFA methodology)
Pilot enviromental zone (POC)	Euro 0,1,2,3	-80 % (PC) -40 % (LDV) +50 % (public transport)	-82,03%
Extended zone (OC)	Euro 0,1,2	-50 % (PC) -25 % (LDV) + 50 % (public transport)	-66,83%
Extended zone – edge	None	-15 % (PC, LDV) +50% (public transport)	-42,32%
Other part of Municipality of Maribor	None	- 30 % (PC) - 15 % (LDV) + 50 % (Public transport)	-57,11%
Municipality of Maribor		-32,1 % (PC) -17,5 % (LDV) +50% (public transport)	-56,34%

**Thank you for your
attention!**

Leibnitz 27 September 2013