



City of Munich
Department of Health
and Environment

Air Quality Policy in Munich since 2004

Ulrich Teichmann

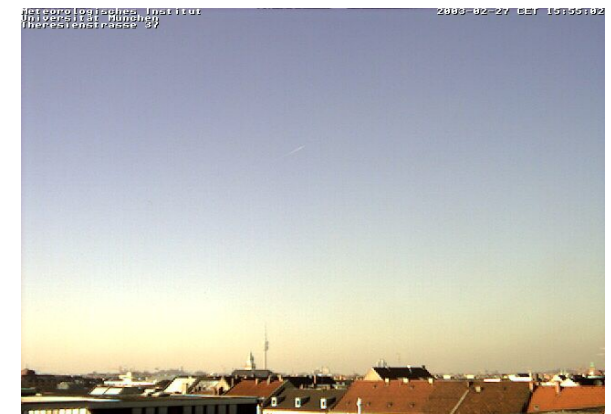
City of Munich
Department of Health and Environment
Environmental Protection
Environmental Planning
Traffic and Air Pollution, Urban Climate



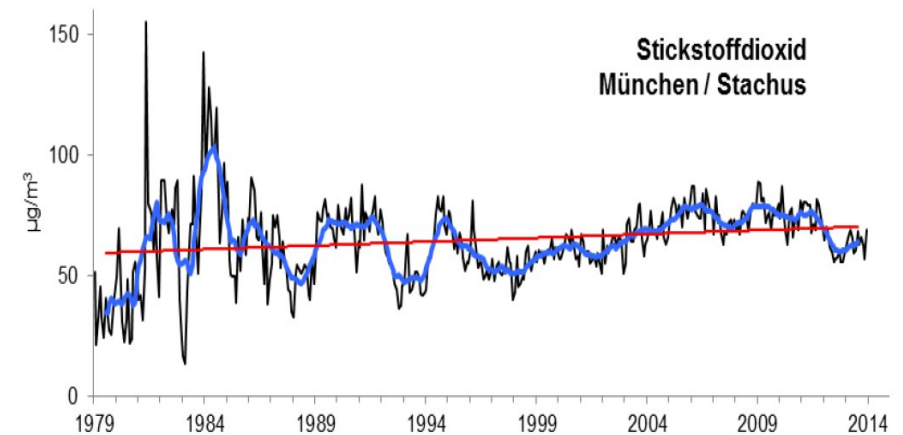
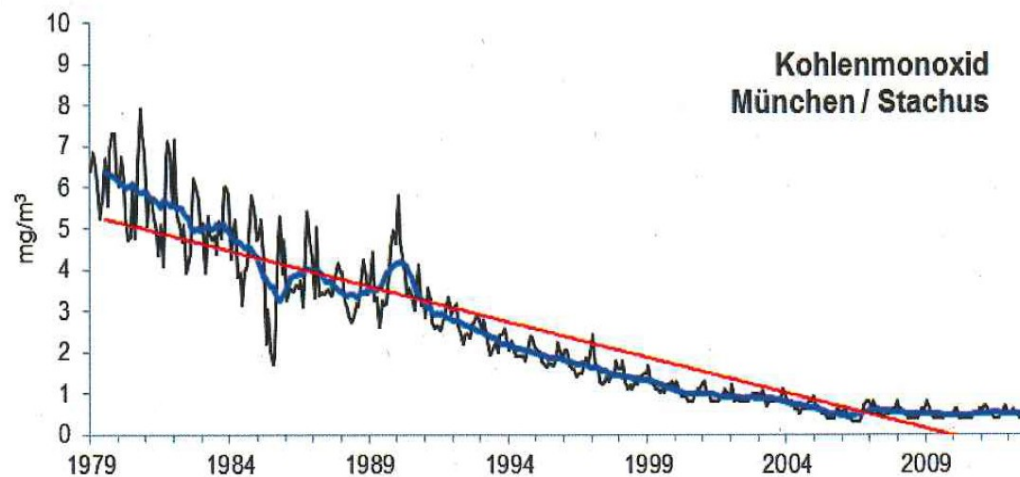
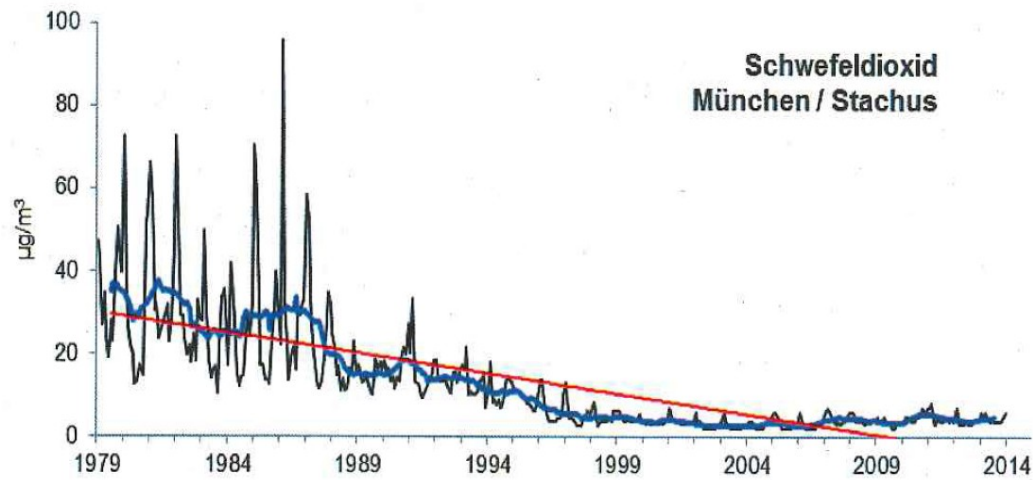
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Air Quality in Munich

in general decreasing air pollution,
e.g. SO_2 , CO ,



BUT



Source: Bavarian Environmental Protection Agency



PM₁₀ daily LV exceedances (LV 2005: 50 µg/m³, 35 exceedances allowed)

	PM ₁₀	PM ₁₀	PM ₁₀	PM ₁₀	PM ₁₀	PM ₁₀	PM ₁₀	PM ₁₀	PM ₁₀	PM ₁₀	PM ₁₀	
Monitoring stations	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
LV (+ MoT)	60	55	50	50	50	50	50	50	50	50	50	
Stachus	56	44	51	52	30	21	33	47	35	14 (11)*	19	14
Luise-Kiesselbach-Platz	42	29	30	44	24	17	-	-	-	-	-	
Johanneskirchen	-	3	18	26	12	13	13	23	9	4	8	6
Lothstraße	29	22	24	39	19	11	16	27	11	5	11	8
Landshuter Allee	-	(24)	107	92	53	61	52	65	48** (17)**	27 (17)*	39 (30)*	17
Prinzregentenstraße	-	(6)	40	39	15	14	15	31	17	-	-	
Andechs (rural)	5	4	4	15	7	7	1	11	4	5	2	1

LEZ ---->

Source: Bavarian Environmental Protection Agency

* winter salting subtracted

** with time extension

Luck, good weather and/or good measures?



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NO₂?



www.muenchen.de/umweltzone



Nitrogen dioxide NO₂ annual mean (LV 2010: 40 µg/m³)

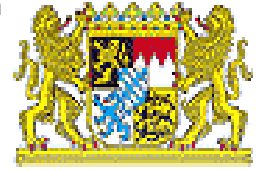
	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	
Monitoring stations	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
LV (+ MoT)	54	52	50	48	46	44	42	40	40	40	40	
Stachus	68	69	76	79	71	74	78	74	76	60	64	62
Luise-Kiesselbach-Platz	75	68	72	74	69	63	-	-	-	-	-	
Johanneskirchen	26	24	30	33	30	28	30	28	23	22	22	22
Lothstraße	42	42	44	45	42	35	35	35	33	31	31	31
Moosach	45	39	43	45	35	37	38	39	39	35	-	
Landshuter Allee	-	-	92	98	89	85	92	99	85	81	81	83
Prinzregentenstraße	-	-	66	68	71	77	74	68	61	-	-	
Andechs (rural)	-	18	11	10	13	14	10	8	7	7	8	7

LEZ --->

Source: Bavarian Environmental Protection Agency



Air Quality Policy in Munich



Air Quality Plan for Munich, AQP (28.12.2004)

mostly general traffic related measures, Small Combustion Regulation for Munich

Air Quality Plan is not a closed process, but a permanent challenge

- decision of Munich City Council **Implementation of LEZ** 26.07.2006

- judgement Federal Administrative Court of Germany (BVerwG) 27.09.2007

1st update AQP 19.10.2007 HDV ban

- judgement European Court of Justice 25.07.2008

2nd update AQP 21.08.2008

Implementation Low Emission Zone (LEZ) stage 1

3rd update AQP 12.04.2012

Involving the outer conurbation area (ongoing process)

4th update AQP 05.09.2010

Implementation LEZ stage 2

Implementation LEZ stage 3 01.10.2012

after impact study of LEZ and check of reasonability

- judgement Bavarian Administrative Court (VG) 09.10.2012 (DUH, e.g. expansion of LEZ9

- objectives were raised by EU against time extension notification for NO₂-LV 20.02.2013

5th update AQP 20.05.2014 including speed restriction at hot spot 'Landshuter Allee'

- judgement BVerwG 05.09.2013, april 2014 judgement VG finally in force

- EU Pilot Procedure 22.09.2014 NO₂ Germany (incl. Munich)

6th update in progress (new feasibility study)

- ??????????????????





Comparison 2007/2008 HDV > 12 t Counting points: Autobahn Authority of Southern Bavaria

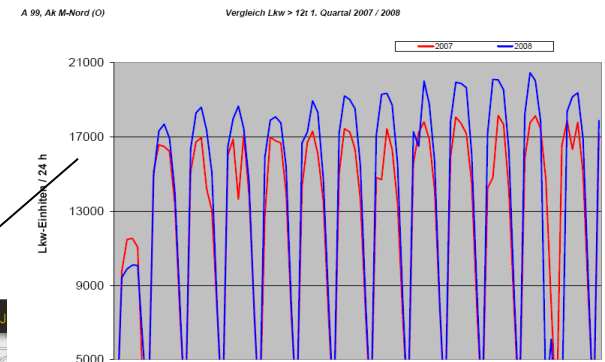
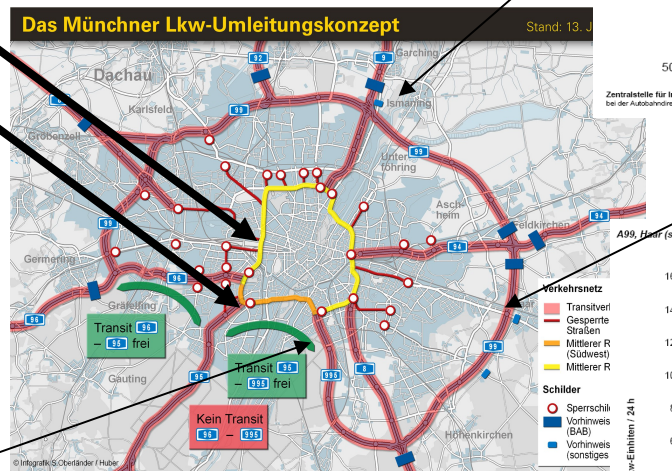
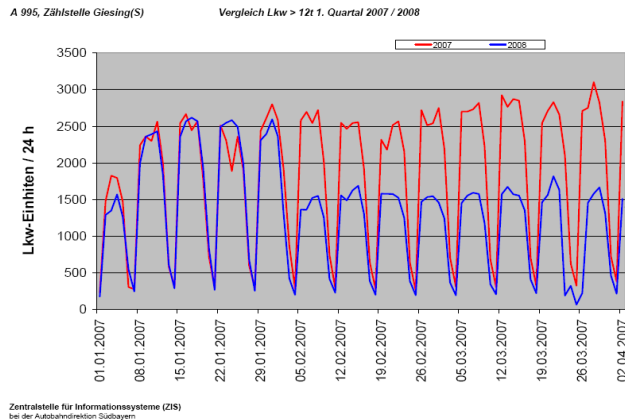
Counting points: City of Munich

Landshuter Allee: -18 %

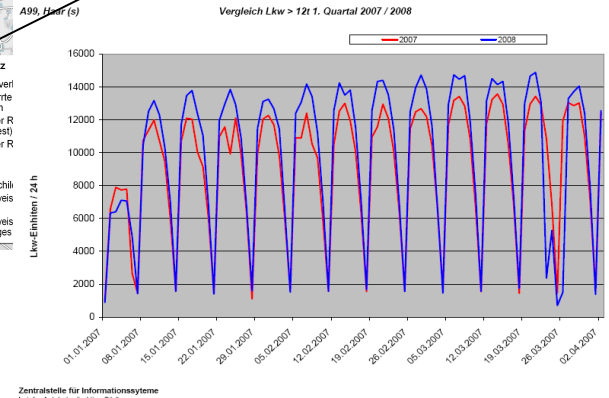
Heckenstallerstraße: -15 %

HDV > 3.5 t

A 995 Giesing



A 99

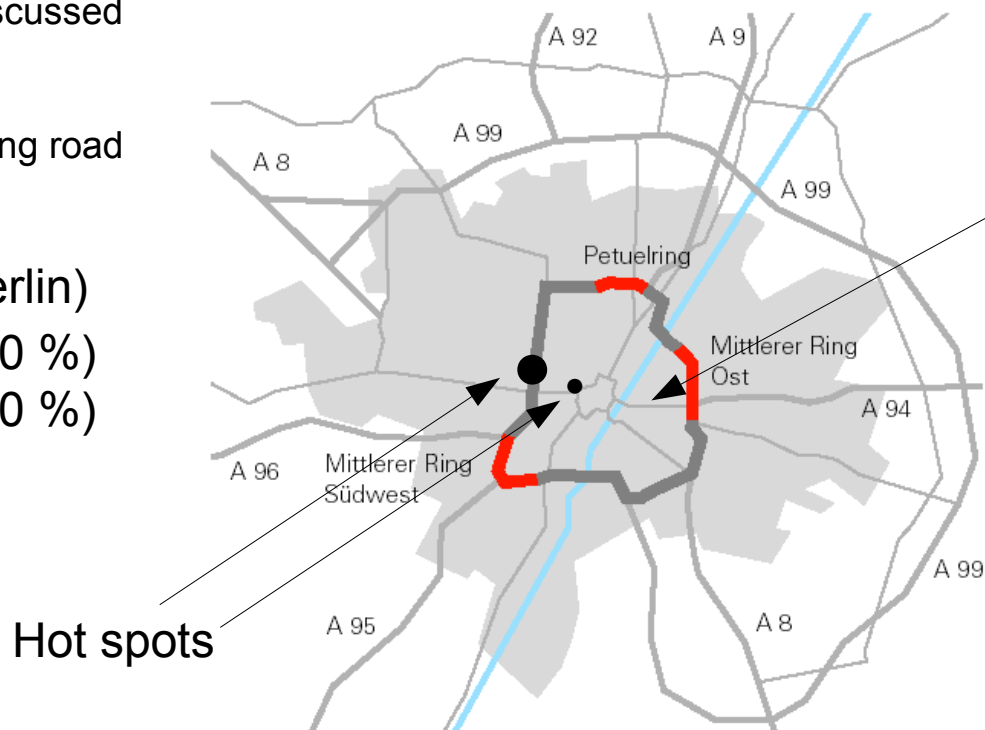




Decision of City Council 26.07.2006: Implementation of 'LEZ'

4 alternative szenarios were discussed
whole city
inside middle ring road
inside middle ring road incl. ring road
inner ring road

Munich		(Berlin)
44 km ²	15 %	(10 %)
426284 inh.	33 %	(30 %)



Hot spots

Der Mittlere Ring im großräumigen
Verkehrsnetz

stage 1 (without sticker):

whole city: 25.880 passenger cars + 13.759 HDV

inside MR: 5.100 passenger cars + 982 HDV

stage 1,2,3: 3-4 %, 6 %, 13 % PC / 30 %, 40 %, 70 % HDV

exemptions: ca. 33300
infringements: ca. 31500
(fines: ca. 10300)



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from 07/2004

Traffic (daily average):

138.000, HDV 7.700 (5.6 %)

width: 55 m, 4-5 floor buildings

tunnel portal (approx. 200 m)

107 exceedances of PM_{10} daily LV in
2005

99 $\mu g/m^3$ NO_2 yearly average in 2010

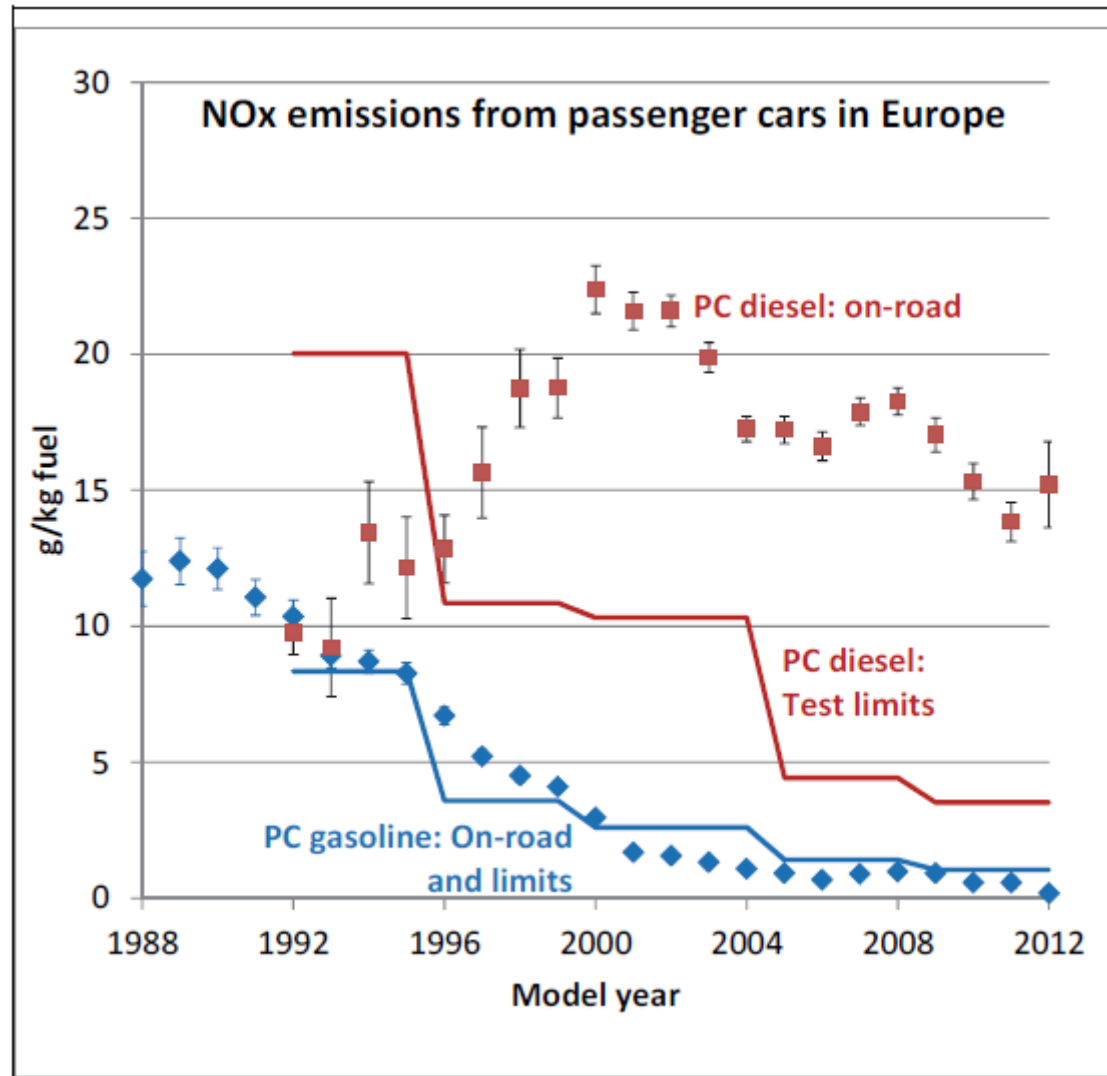


Conclusions:

- german sticker system: PM only

 - > blue sticker (EURO 6/VI, electric/hybrid cars): user benefits???

NO₂: chance with ULEZ but with 'real' EURO 6/VI (see results Graz)???





Some research results concerning **Diesel passenger cars** presented at the 20th International Conference 'Transport and Air Pollution', Graz (Austria), September, 18-19 2014

A test programme conducted on two **Euro 6 Diesel vehicles** reinforced concerns that Diesel NO_x emissions in real driving may **substantially exceed** the emissions levels certified during the Type Approval test.

This supports the notion **that the technology for clean Diesels** (i.e., vehicles whose average emission levels lie below Euro 6 emission limits under real-world driving) **already exists, and that the right policies could incentivize manufacturers to apply them across the board.** Unless the appropriate technical measures are adopted, the high on-road emissions of NO_x from the new Diesel technology classes of passenger cars could have serious adverse health effects in the exposed population.

On-Road Testing and PEMS Data Analysis for two Euro 6 Diesel Vehicles

J. May1*, C. Favre1, D. Bosteels1, J. Andersson2, D. Clarke2 and M. Heaney2

1 Association for Emissions Control by Catalyst (AECC), Brussels, BE-1030, Belgium; info@aecc.eu

2 Ricardo UK Ltd., Shoreham Technical Centre, Shoreham-by-Sea, West Sussex, BN43 5FG, UK.

Assessment of PEMS Datasets from Modern Diesel Passenger Cars

V. Franco1*, P. Mock1, F. Posada2

1 ICCT Europe, the International Council on Clean Transportation, Neue Promenade 6, Berlin, 10178, Germany, vicente@theicct.org

2 ICCT, the International Council on Clean Transportation, 1225 I Street NW, Washington DC, 20005, USA



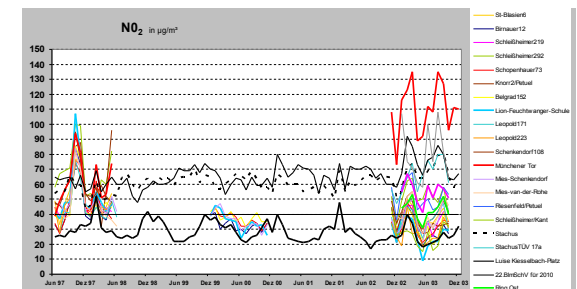
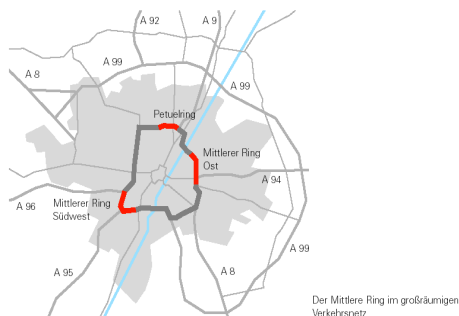
Measures

- Enhancement of Public Transport (PT)
better network, acceleration, Test Hybrid-Electric-buses
- Better exhaust standards for PT-Buses (EEV standard)
- Better municipal car fleet (natural gas, electric vehicles, no Diesel cars, GTL)
- Enhancement Park & Ride (32 sites 7460 places)
Enhancement Bike & Ride (25000 places and 3 indoor parking garages)
- Parking place management
- Environmental friendly traffic management
- City-Logistic hubs
- Synchronised traffic lights (better traffic flow)
- Enhancement of bicycle traffic (14% → 17%)
- Munich Small Combustion Regulation
- Action Programme Climate Protection



Measures reviewed or discussed:

- Winter salting
necessity and wet cleaning
use of CMA
heating to avoid salting
- Road traffic
speed reductions, temporary road closure
judgement VGH: not reasonable
- Road tunnels
feasibility study 'Middle Ring Road' (ongoing)
treatment of tunnel air (filters?), costs
- Shift of bus stop
- Photocatalytic treatment of streets, sidewalks and walls
-





Summary

- Air quality policy in Munich covers more than only LEZ
- A lot of activities, achievements were made, but LV are still exceeded, measures are ongoing
- Only measures on local level can not solve the problem: national + EU-level
 - Revision of TSAP 2013/2014, partly stopped by new EC
 - general reduction of traffic
- Infringement procedure by EU?



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IDEAS?

