

# City of Hagen

Germany / North Rhine-Westphalia

195.000 inhabitants

29.000 buildings

105.000 homes

160 km<sup>2</sup> area

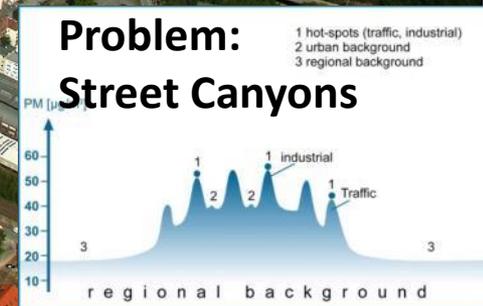
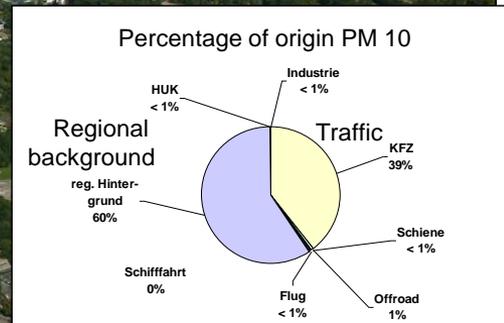
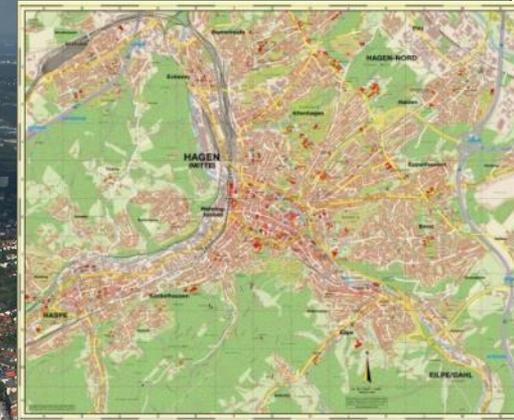
22 % building area

21 % agricultural area

42 % wood land

84 bis 438 m altitude a.s.l.

situated in basin and valleys

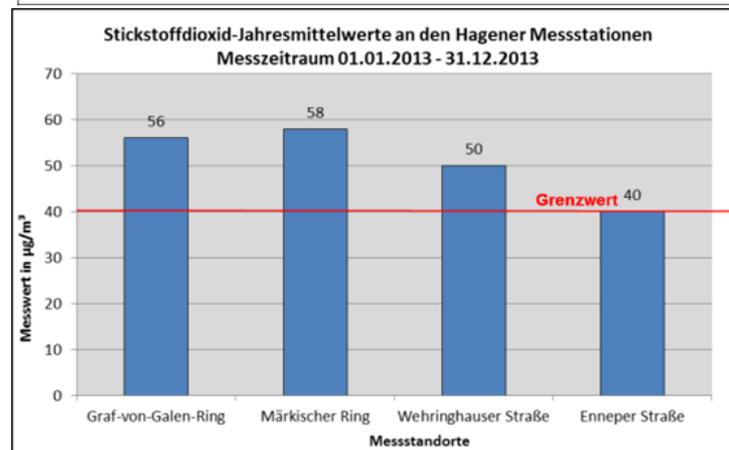
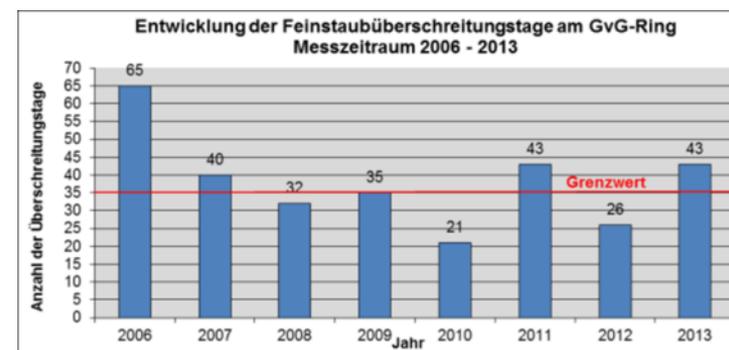


## Clean Air Management as an important part of an integrated and sustainable Traffic and Urban Development Plan

Legal basis: EU-directive 2008/50/EG of European Parliament and Council dated May 21, 2008 about air quality and clean air in Europe



EU legal limits and deadlines for particles PM2,5 / PM10 and NO2			
Stoff	Mittel über	Grenzwerte	Einhaltungsfrist
Partikel-PM2,5	Zielwert, 1 Jahr	25 µg/m <sup>3</sup>	seit 01.01.2010
	Grenzwert Stufe 1, 1 Jahr	25 µg/m <sup>3</sup>	ab 01.01.2015
	Grenzwert Stufe 2, 1 Jahr	20 µg/m <sup>3</sup>	ab 01.01.2020
Partikel-PM10	24h	50 µg/m <sup>3</sup> 35 Überschreitungen/Jahr	seit 01.01.2005
	1 Jahr	40 µg/m <sup>3</sup>	seit 01.01.2005
NO2	1h	200 µg/m <sup>3</sup> 18 Überschreitungen/Jahr	seit 01.01.2010
	1 Jahr	40 µg/m <sup>3</sup>	seit 01.01.2010



§ 3 Legal limits for nitrogen dioxide (NO2)

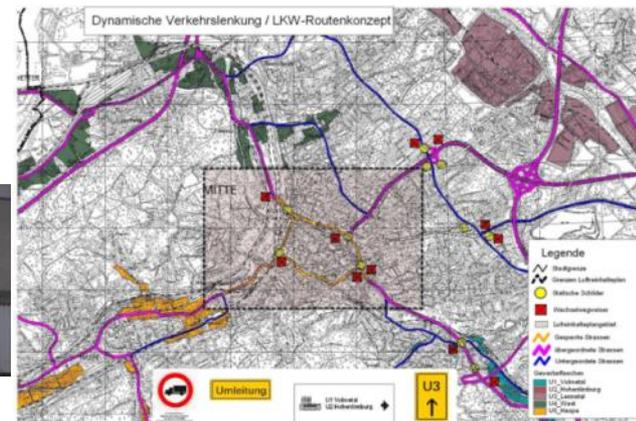
§ 4 Legal limits for particulate pollution (PM10)

Transformation into a national law and by directive about air quality standards and maximum limits of emissions (39. BImSchV, akt. 2015)

# City of Hagen

## Integrated Clean Air Management: Measures and its importance + /++/+++

- Lorry-routing concept / dynamic immission-controlled traffic routing +++
- Tempory driving bans for lorries +++
- Retrofitting public busses (particle filters-/motor optimisation) ++
- Hybridbusses & smart GPS function +
- City-logistic: pooling of urban commercial transport +
- Use of (electric) fright bikes +
- Bypass road at train station +/+++
- Relocation of potential deviation for lorry traffic from highways +
- Signs on exits of highways +
- Implementation in GPS systems +
- Relocation & ban of overland busses with regard to street canyons +
- Information & strict controlling of regulations by city authorities and police ++



## Integrated Clean Air Management: Measures

- Optimisation of traffic flow by traffic light pre-emption +
- Speed limit of 30 km/h in neuralgic street sections ++
- Mobility concepts for public and private enterprises +
- Low emission street cleaning and garbage trucks +
- Implementation of **Low Emission Zone** , ++/+++ next: Blue emission sticker?



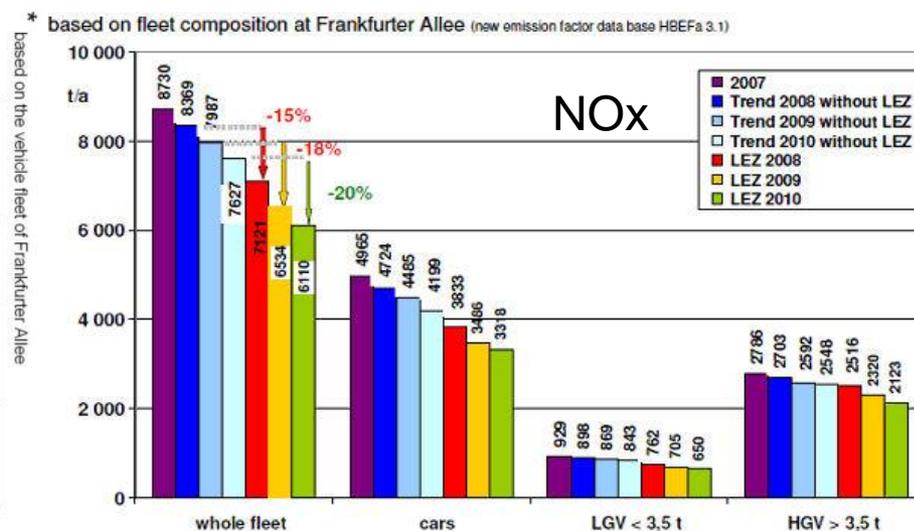
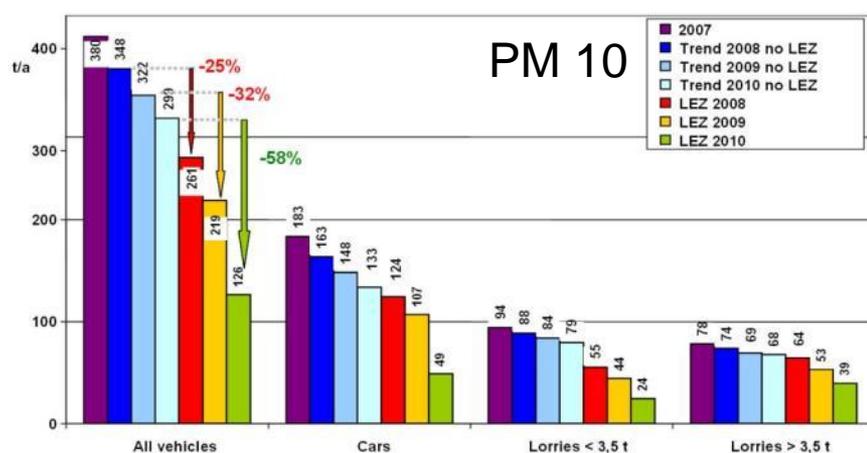
### Emission Stickers by National Order

Schadstoffgruppe	1	2	3	4
Plakette:	keine Plakette			
Anforderung für Diesel	Euro 1 oder schlechter	Euro 2 od. Euro 1+ Partikelfilter	Euro 3 od. Euro 2+ Partikelfilter	Euro 4 od. Euro 3+ Partikelfilter
Anforderung für Benzin	ohne geregelt Kat			Euro 1 mit geregelt Kat oder besser

## Integrated Clean Air Management: Low Emission Zone as Core Element

**Berlin:** a scientifically proven example of the outcome / eco value  
of a **Low Emission Zone**

Reduction of diesel particle emission\*



- Low emission zone has reduced PM10
- Decrease of critical exceedances from 28 to 22 days /year (minus 24-14%)
- Diesel-oil-particle- & PM<sub>10</sub>- concentrationen minus 3% on main roads
- Emissions of NOx were leading to NO<sub>2</sub>-pollutions in the air
- Low emission zone has reduced NO<sub>2</sub> up to 20% !

# City of Hagen

## Integrated Clean Air Management: Low Emission Zone as Core Element

### Outcome / Eco value is in general dependent from:

- Basic level of emissions (regional & urban background)
- Extent of green zone
- Rigorousness of restrictions (color of emission stickers)
- Consistent regulations (exceptions, controlling etc.)
- Number of involved cars & their kilometric performance
- Composition of fleet before installing low emission zone (age, kind of vehicle, %-of diesel- / gasoline engines)
- Options of car holders to react (high force for new or second hand buys, retrofitting & particle filters)
- Impact of different sources of pollution (Does traffic have a high proportion of immissions?)
- Appearance of extreme inversions per year

In Hagen: about 200 inversions / a,  
mostly in winter



## Additional measures to change mobility & emission behavior:

- Optimisation of quality & supply of public transport system +++
- Instruction of public transport drivers +
- Car & e-car sharing & smart city solutions ++
- Integrated private-public traffic concepts +++
- Creation and updating bike routing concept +++
- Mobility stations and lockable bike boxes ++
- Bike lanes, bike priority roads, bike fast lanes ++
- E-bike charging stations
- Biking promotion „Burn fat–not oil! „Office bikes!“ +
- Consulting on private transport-companies in retrofitting vehicle fleet & use of e-alternatives +
- Guide book for energy saving behavior and options for fundings +
- Promotion of project „ECO-PROFIT“ for companies & enterprises +
- Use of certification program „European Energy Award®“ +
- Environmental education in kindergardens, schools, theater etc. +
- Use of low emission construction / maintenance vehicles & machinery +
- Information about use of wood fired chimneys („Chimney signal light“) +



## Additional measures by means of planning, construction, controlling:

- Mandatory consideration of clean air management in land-use planning +++
- Alignment / harmonisation with other sectoral plans e.g. noise reduction + +
- Stepping up of greening measures along roads (dust absorbing vegetation) + +
- Support e-mobility structures (charging stations, free e-car parking, e-taxi) +++
- Performance review of clean air management (periodical check of implementation, flexible adjustment of measures & timeline, new evaluation +++
- Check of outcome/eco benefit (measuring up & evaluation emissions / immissions, continuous monitoring of air quality, simulations etc.) +++
- Raise rate of adherence of road signs & regulations by continuous controls and by monetary fining (police, city authorities, speed and weight cameras) +++
- Demand to state taking over responsibility by forcing car industry (e.g. VW-scandal), raise taxes for polluting vehicles, incentives for e-mobility-, bike-, public transport-, smart city-, sustainability-programs +++

