

# LEZs in Europe



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# What is a Low Emission Zone?

A ban or charge for polluting vehicles entering an area

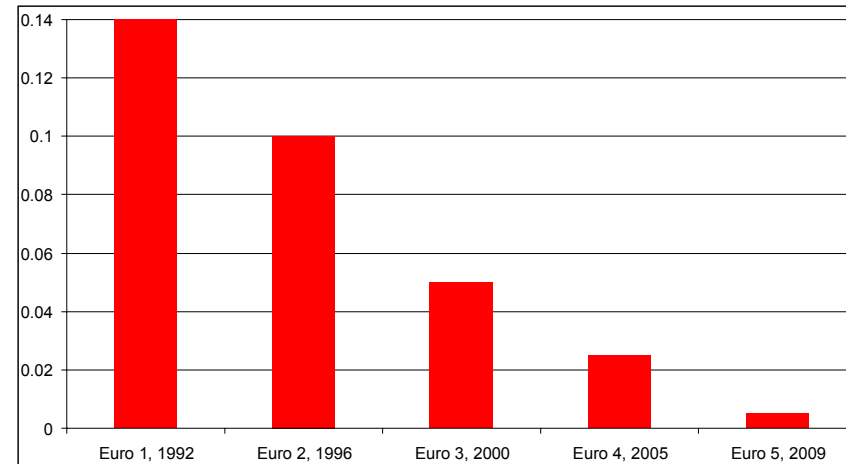
Purpose: to improve health

Reducing emissions  $\Rightarrow$  better air quality

Improving air quality  $\Rightarrow$  better health

# Low Emission / Environment Zones

- Based on Euro standards
  - Tightening emissions standards for vehicles
  - g/km for diesel car Euro standard:



- For most cities it is the most effective measure to improve air quality
- All include heavy duty vehicles - which are more polluting per vehicle, some include vans, cars & motorcycles

# LEZs in Europe

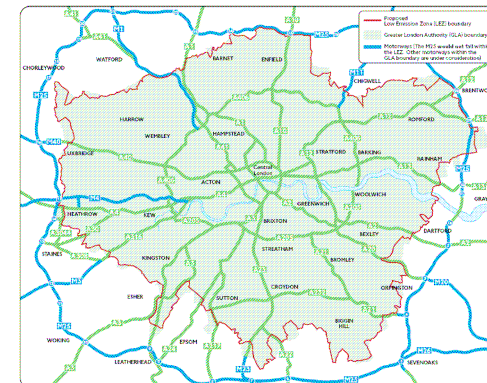
There are over 60 LEZs in operation or planning Europe.  
More will follow

- 3 in operation **Sweden**
- 4 regional in operation in **North Italy**, covering many towns
- 22 confirmed in **Germany**, ~ 15 in air quality plans
- 1 confirmed in **UK**
- 7 in operation + 9 confirmed in the **Netherlands**
- 5 confirmed in **Denmark**
- 3 in planning in **Norway**
- 1 in consideration in **Spain**
- Most have 2 phases – Phase 2 having greater effect
- The most are focused on particulate matter

# LEZs for large cities as well as smaller towns

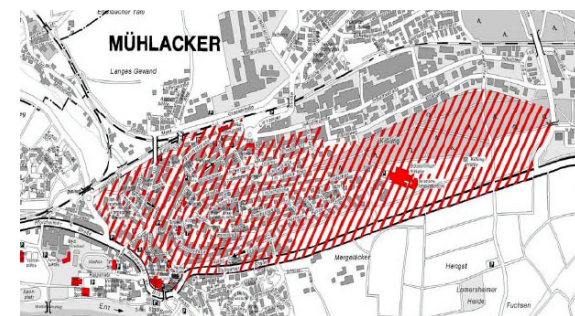
- London

- population 7 million, area 1600km<sup>2</sup>
- Heavy vehicles 2008 Euro 3 (PM)  
2012 Euro 4 (PM)
- heavier vans 2010 Euro 3 (PM)
- Camera enforced, 300 €/day if not meet standards



- Mühlacker (B-W Germany)

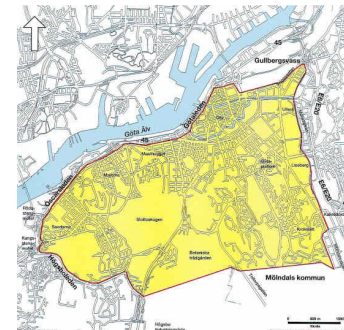
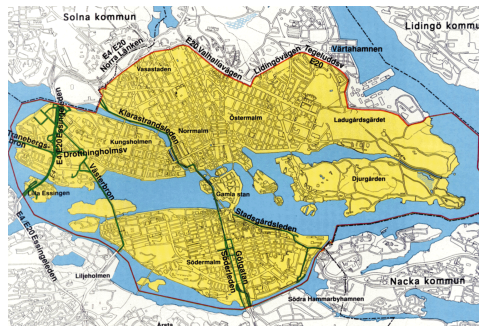
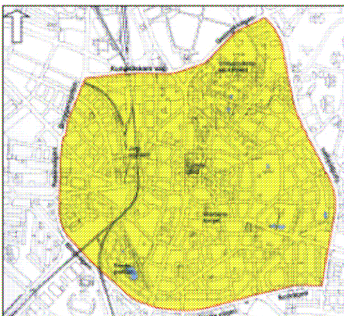
- population 26 000
- all diesel vehicles 2010 Euro 2 (PM)  
2012 Euro 3 (PM)
- manual enforcement



# Sweden



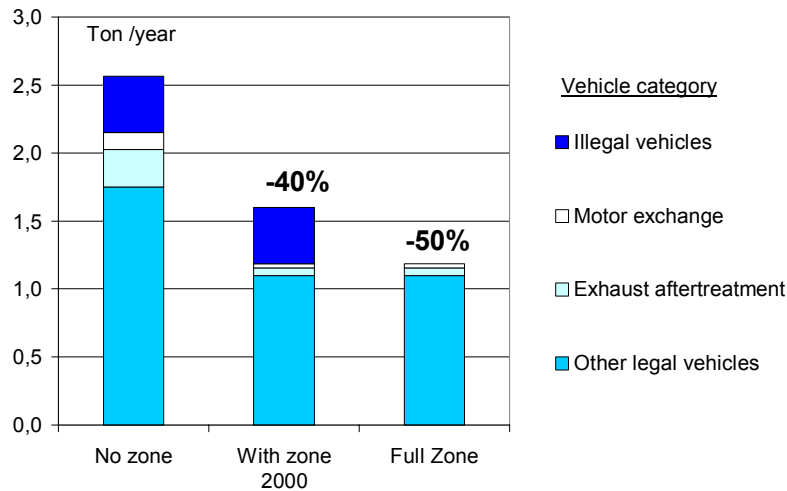
- Have been in operation since 1996
- Now cover 4 towns, Stockholm, Malmö, Gothenburg and Lund
- Emissions standards to be met by all heavy vehicles - lorries, buses, coaches
  - Currently:
    - Vehicles < 6 years old, or those 6-8 years = Euro 2
  - From 2010
    - Vehicles <6 years old or 6-8 years = Euro 3
    - Euro 4 allowed in until 2016, Euro 5/EEV until 2020
  - Manually enforced, vehicles can be taken off the road



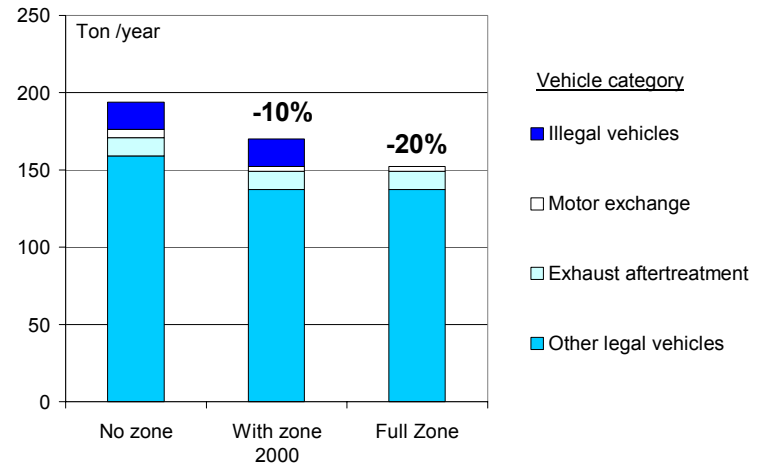


# Impact of LEZ in Stockholm

## Emissions of PM<sub>10</sub>



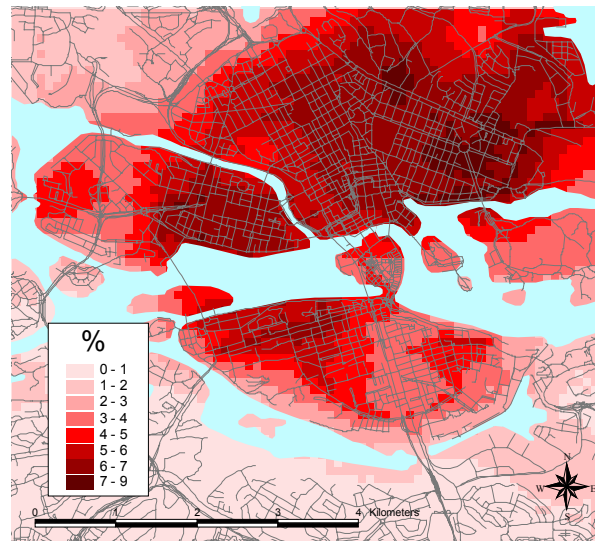
## Emissions of NO<sub>x</sub>



## Concentrations of PM<sub>0.2</sub>

Zone 2000: 0.5 - 9 %

Full zone: 0.5 - 12 %



# A few examples - Germany

- National framework, local decision and implementation
  - 22+ towns, beginning between 2008 & 2010
    - Class 2: All diesel vehicles Euro 1; Euro 2 (PM)
    - Class 3: All diesel vehicles Euro 2; Euro 3 (PM)
    - Class 4: All diesel vehicles Euro 3; Euro 4 (PM) + petrol Euro 4
  - eg Berlin Class 2 from 2008, Class 4 from 2010  
Freiburg Class 2 from 2010, Class 3 from 2012
  - Baden-Württemberg co-ordinating 14 towns - those with PM<sub>10</sub> problem start March 2008; NO<sub>2</sub> problem 2010
- Diesel particulate filter retrofitting encouraged to meet the standard
- Manually enforced with sticker, fines & points on your driving licence
- Have tax incentives & cheaper loans to help compliance with retrofitting



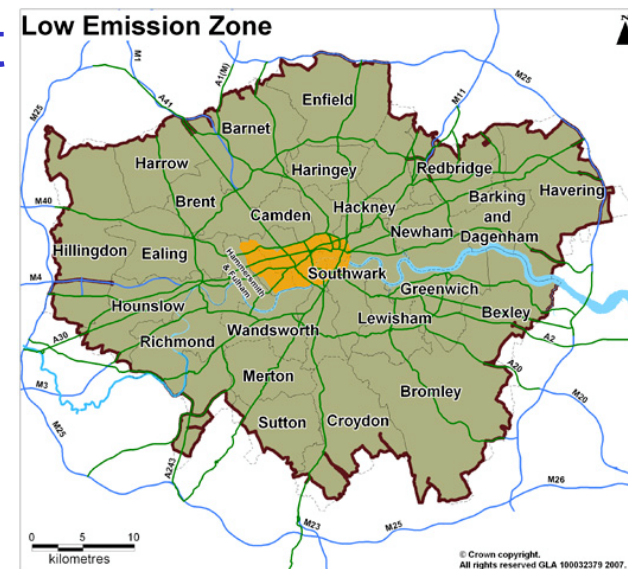




# London

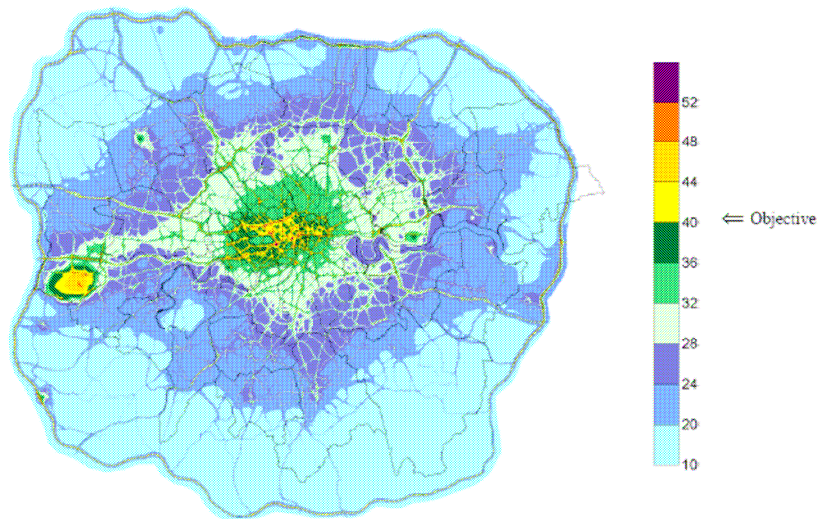


- 1600km<sup>2</sup>, lorries, buses, coaches, vans, minibuses
- Timeplan
  - February 2008: Euro 3 (PM) for heavy goods vehicles over 12T
  - July 2008: Euro 3 (PM) for HGV 3.5T - 12T, buses, coaches
  - October 2010: Euro 3 for vans >1.025T & minibuses
  - January 2012: Euro IV (PM) for HGVs, buses & coaches
- Camera enforced, 200 € a day if not meet standards
- Emissions standards are set as the PM aspect of the Euro standard, & retrofitting can be used to meet this



# Estimated impact of London LEZ

NO<sub>2</sub> in 2010 without LEZ



Year	Area exceeding 2010 NO <sub>2</sub> Limit Values	
	% area	% exposed pop.
2008	5.2%	5.9%
2010	3.7%	4.6%
2012	15.6%	17.1%
2015	7.4%	8.1%

Year	Area exceeding PM <sub>10</sub> 2004 Limit Values	
	% area	% exposed pop.
2008	7.4%	4.9%
2010	12.4%	12.6%
2012	26.7%	21.4%
2015	11.0%	11.3%

# Italy

- 4 regional LEZs under an agreement of the North Italian regions
- all vehicles, including motorcycles
- Time limited, and only in winter
- E.g: South Tirol:
  - 7:00 – 10:00 & 16:00 – 19:00, Monday - Friday
  - bans all pre-Euro 0 and Euro 1 vehicles, & all 2-stroke motorcycles
- Primarily aimed at local vehicles, more at private vehicles as commercial vehicles
- Time dependence allows those on lower incomes to still access the city, but adds complexity
- Retrofitting of filters is encouraged



# The Netherlands

- 7 in place this year, 9 more starting 2008
- National approach:
  - Local schemes under a national covenant until national law in place, together with grants
- Heavy duty only
  - Until 2010
    - Euro 1 and less banned
    - Euros 2 & 3 require filter
    - Euro 4, 5, 6, EEV, gas, hydrogen, E85 allowed in
  - After 2010 are:
    - Euro 2 and less banned
    - Euro 3 require filter & must be <8 years
    - Euro 4, 5, 6, EEV, gas, hydrogen, E85 allowed in
  - After 2013
    - Only Euro 4, 5, 6, EEV, gas, hydrogen, E85 allowed in

# Norway

- In Planning for 3 towns
- Works on an 'Environmental Tax' basis
- Vehicles <Euro 4 pay
  - Euro 2 & 3 = 20 000€ / year
  - Euro 1 = 34 000€ / year
  - pre-Euro = 60 000€ / year
- Camera and Transponder enforced

# Ban for polluted vehicles on motorways

- Austria & North Italy have ban for Euro 0, 1, 2 lorries on certain motorways
  - Austria on 89km of the A12 from Kufstein to Zirl
    - Trailer lorries >7.5T banned Euro 0 & Euro 1 since 1.1.2007, Euro 2 from 1.11.2008.
    - LKW without trailer >7.5T banned for Euro 0 & Euro 1 from 1.11.2009
  - Austria has a night-ban for lorries less than Euro 4
  - Italy on 180km of the A22
    - Ban Euro 0 & 1 lorries
    - Considering banning Euro 2 in the future

# Conclusion

- There are many LEZs in operation & planning in Europe, with many different 'models' to choose from
- LEZ can be an effective measure to improve air quality
- They can require the fitting of filters or replacement of older, more polluting vehicles
- Many countries in the EU are implementing or considering LEZs
- Switzerland many places that will not meet the health-based air quality targets, and which could be improved with LEZs
- Swiss cities and Government should take further investigations and steps towards LEZs