National Institute for Public Health
and the Environment
Ministry of Health, Welfare and Sport

Local measures for better air quality in Utrecht

Joost Wesseling, Rob Maas,
Jan Aben, Wilco de Vries

Concentrations in municipalities

- Over the last few years several municipalities in the Netherlands have started to develop their own air quality policies.
- Most of these are aimed at reducing concentrations within the cities quicker than is presently expected.
- Several of the cities are very ambitious and are running into problems with the (until recently) much less ambitious national government.
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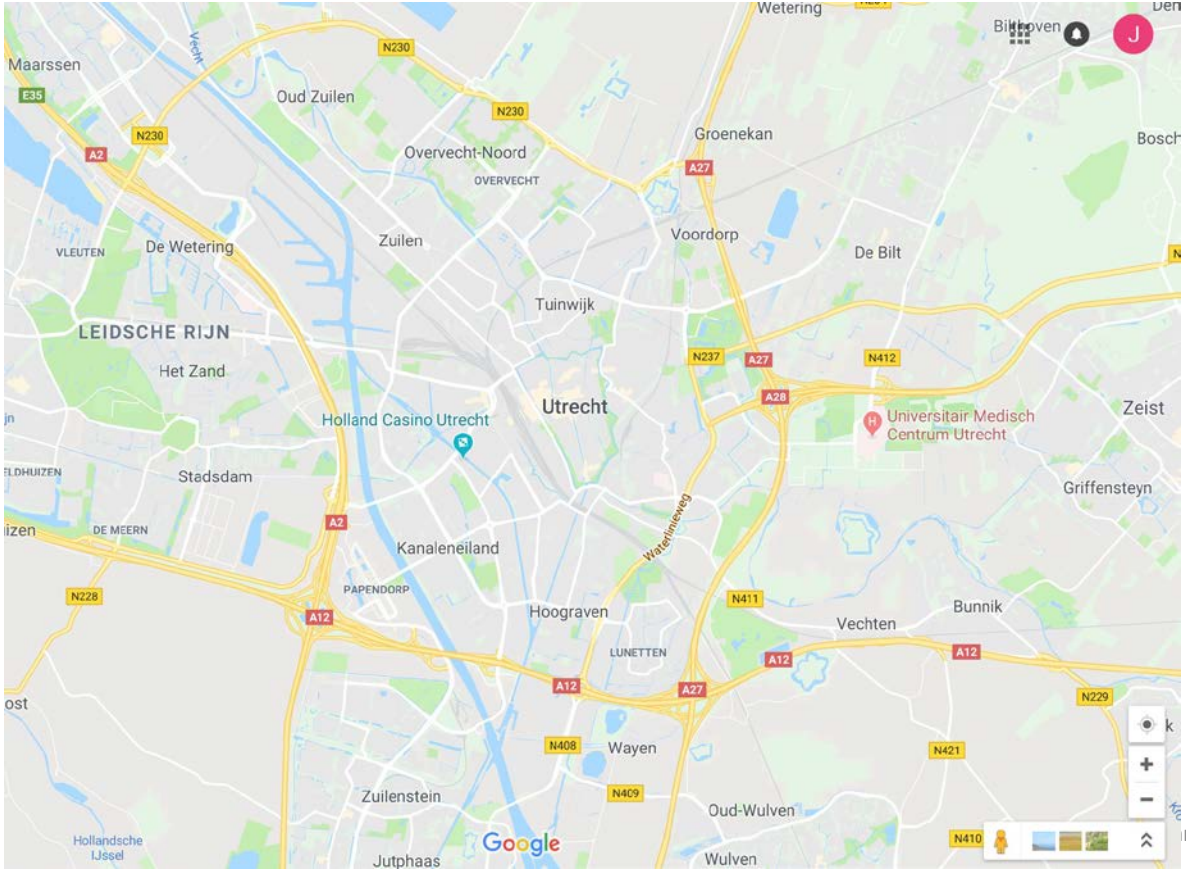
Utrecht



Utrecht is a relatively large city in the middle of The Netherlands, with some 340000 inhabitants.

It is surrounded by a number of very busy highways.

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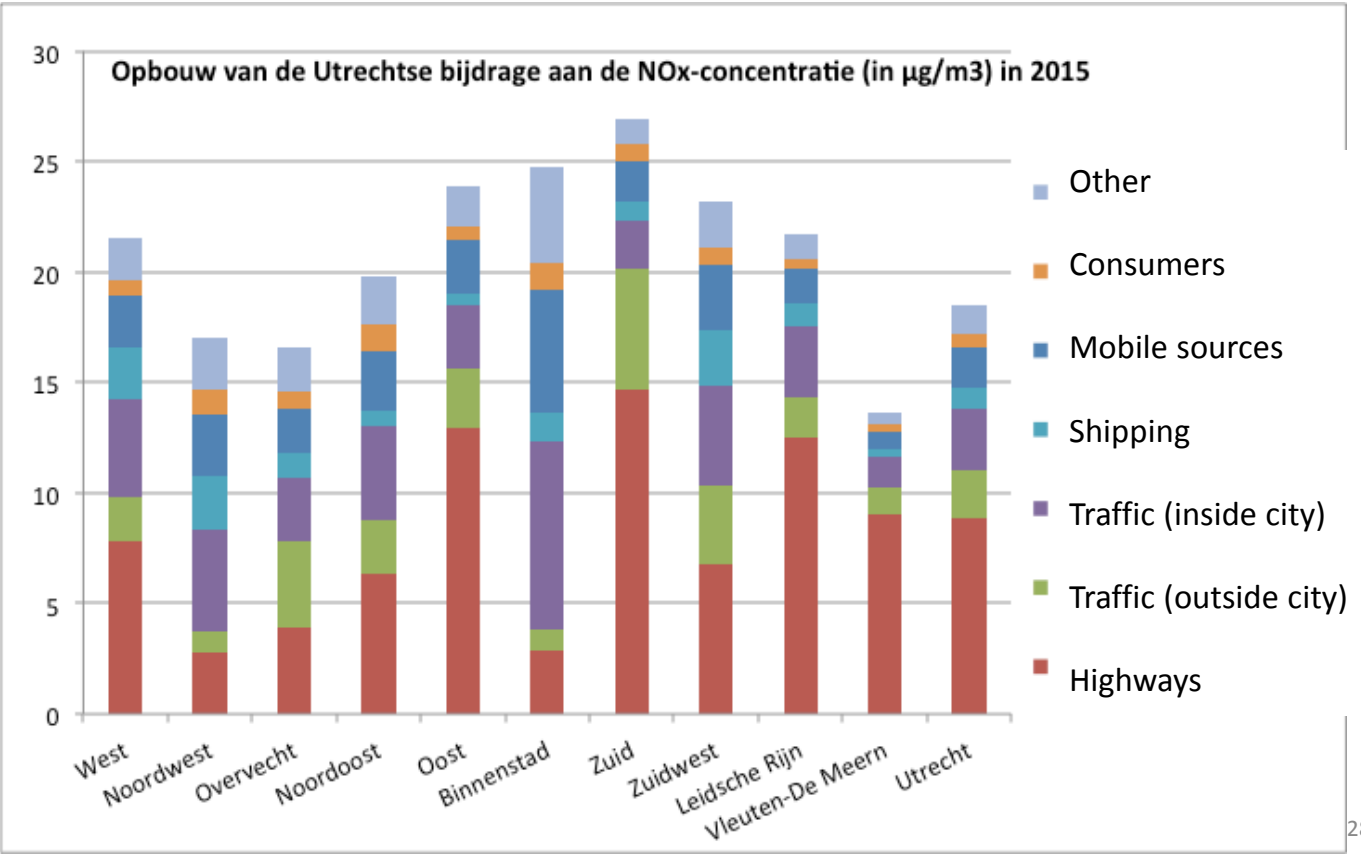
Concentrations in Utrecht

- At the request of the municipality of Utrecht, the RIVM has made a detailed analysis of the build-up of concentrations in the city.
- The basic model (OPS) of the RIVM was used to calculate the concentration distribution in cells of 250x250 m2 for NO2, PM2.5 and EC.
- As much detail as possible was taken from local sources.
- Concentration contributions from different types of sources can be looked at:
  - City / Surroundings / Netherlands / Abroad / Shipping
  - Contributions from neighboring parts of the city to each other
  - Road traffic / Shipping / Consumers / Mobile sources / Other

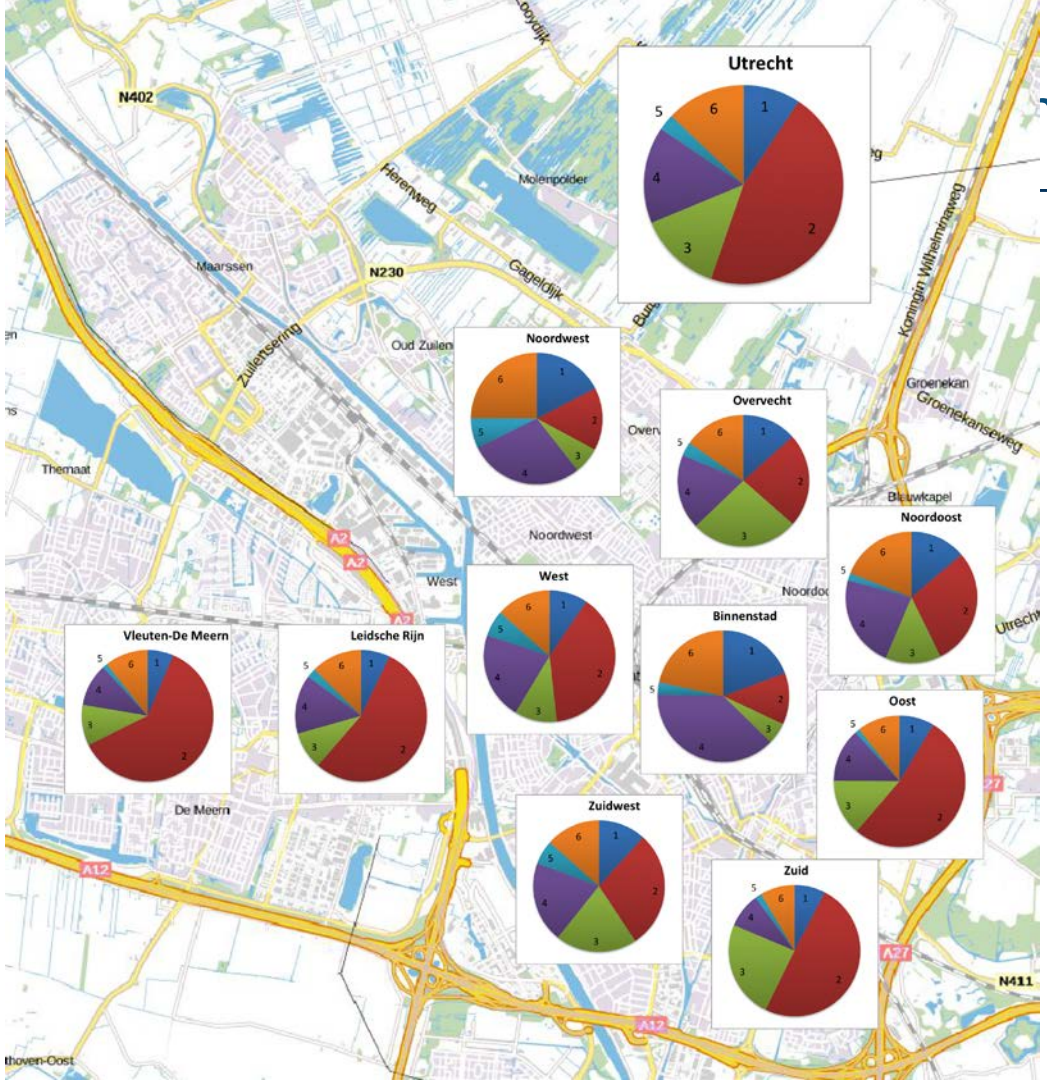
Concentrations in Utrecht



The structure of the total concentrations differs considerably across the Utrecht neighborhoods.

Approximately 50% of the NO2 comes from outside, with particulate matter (PM10 / 2.5) almost 90% and soot (EC) about 50%.

ncentrations in Utrecht



1 = mobile equipment,
2 = road traffic highways,
3 = road traffic outside urban areas,
4 = road traffic within urban areas,
5 = shipping,
6 = consumers

Concentrations in Utrecht

2015	NO2		PM10		PM2.5		EC	
	gemid-delde	gewogen gemid-delde	gemid-delde	gewogen gemid-delde	gemid-delde	gewogen gemid-delde	gemid-delde	gewogen gemid-delde
West	26,8	26,2	20,0	20,7	12,3	12,9	1,12	1,13
Noordwest	24,4	24,5	20,3	20,4	12,6	12,7	1,05	1,06
Overvecht	24,0	23,9	19,9	20,2	12,3	12,6	1,05	1,04
Noordoost	25,8	24,9	20,4	20,7	12,8	12,9	1,16	1,12
Oost	28,3	25,7	20,3	20,5	12,7	12,8	1,25	1,13
Binnenstad	28,8	27,7	20,8	20,9	13,0	13,1	1,17	1,15
Zuid	30,6	25,7	21,0	20,5	13,1	12,8	1,38	1,13
Zuidwest	28,3	26,7	20,5	20,6	12,8	12,8	1,21	1,13
Leidsche Rijn	26,3	20,9	20,2	19,6	12,5	12,1	1,19	0,96
Vleuten-De Meern	22,6	20,5	19,5	19,4	12,0	11,9	1,02	0,92
Utrecht	25,2	24,4	20,0	20,3	12,4	12,6	1,12	1,07

- Average exposures [µg/m^3] for different neighbourhoods of Utrecht.

Luchtkwaliteit → Gezondheid

	Share disease burden	Local contribution
Lucht - PM2,5	44,0%	12%
Lucht - NO2	24,3%	50%
Lucht - Roet	5,0%	50%
Lucht - Ozon	0,5%	0%
Verkeersveiligheid	7,8%	80%
Geluidhinder	5,4%	50%
UV	4,7%	0%
Binnenmilieu	8,2%	50%
Totaal	100,0%	

Approximately 44% of the environmental-related disease burden can be attributed to PM2.5.

Some 12% of the PM2.5 concentration in Utrecht can be attributed to local sources.

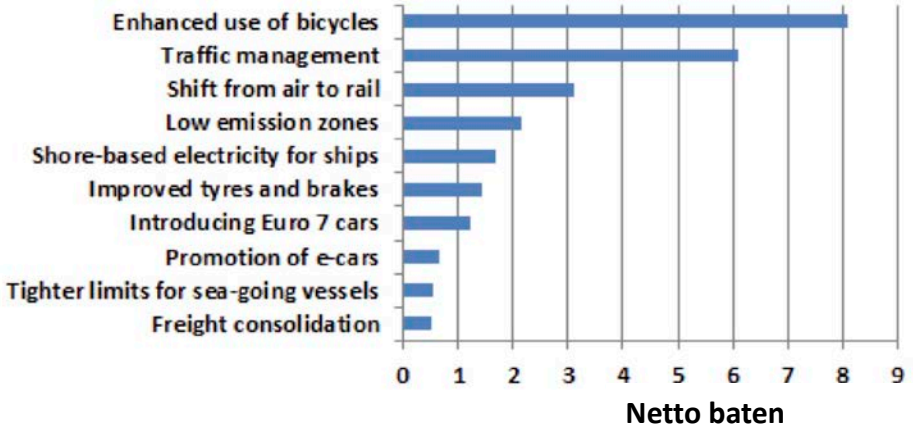
- The airborne substances (NO2, PMx, soot, O3) have different effects on health.
- The contributions/shares from local sources differ.
- Exposure to current levels also leads to health effects.
- The (Dutch) national figures for disease burden can be converted into estimated figures for Utrecht.
- The uncertainty and spread is considerable.
- Average effects are rarely distributed uniformly: many people notice little, a small part becomes ill and has a large loss of healthy life years (DALYs).

Kentallen maatregelen

NAME	JOAQUIN SCORE
Low Emmision Zone (LEZ)	Good
Traffic Restriction	Good
Traffic Signal Coordination	Good
Public Transport	Good
Electric Vehicles (EV)	Good
Congestion Charge Scheme (CCS)	Good
Carpooling	Good
Car Sharing	Good
Active Transport	Good
Speed Limit Reduction	Good
Fuel Taxation	Good
Noise Barriers	Good
Fleet Renewal	Moderate
Parking Management	Moderate
Urban Planning	Moderate
Urban Parks	Moderate
Traffic Reallocation	Moderate
Green Barriers	Moderate
Engine Idling Reduction	Moderate
Street Cleaning	Moderate
Street Vegetation	Low
Air Purifing Building Materials	Low

- Key figures for measures have been discussed and analyzed in many recent projects and studies.
- Significant uncertainty for each effect.
- Implementation / success of measures depends on local choices.

Transphorm studie



Effects measures

Assumed maximum effectiveness of measures (expert judgment)

Max Speed | No/less Less cars | Electric | LEZ | More bikes

	Max snelheid	**Autovrij**	**Autoluw**	**EV**	**LEZ**	**Fietsinfra**
	1000 €/DALY	2000 €/DALY	2000 €/DALY	2000 €/DALY	2000 €/DALY	4000 €/DALY
Lucht PM2,5	20%	100%	50%	50%	20%	50%
Lucht NO2	20%	100%	50%	100%	20%	50%
Lucht - Roet	20%	100%	50%	100%	50%	50%
Lucht ozon						
Verkeersveiligheid	50%	100%	50%	0%	0%	70%
Geluidhinder	10%	100%	50%	30%	0%	20%

Health effects measures

- With the available calculated concentration distributions, estimated effects of measures and health effects, an indication can be given of the possibilities for local policy in Utrecht.
- An effective policy requires constructing a coherent package and dialogue with stakeholders.
- The larger the area in which air policy is implemented, the greater the health effect will be.

	Max Speed	No/less Less cars	Electric	LEZ	More bikes
Lucht - PM2,5	86	428	214	214	86	214
Lucht - NO2	197	986	493	986	197	493
Lucht – Roet	41	203	102	203	102	102
Lucht – Ozon						
Verkeersveiligheid	253	506	253			354
Geluidhinder	22	218	109	65		44
Totale DALY winst Utrecht	**598**	**2340**	**1170**	**1468**	**384**	**1206**
Fractie totaal DALY's	**7%**	**29%**	**14%**	**18%**	**5%**	**15%**

Questions?