

80 km zones and dynamic speed limits in the Netherlands

TNO | Knowledge for business



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Objectives of 80 km measure

- Objective: to reduce noise and air pollution
- Initially, 2 kilometres of urban motorway (in Overschie) equipped with trajectory control (tested and proved in mid 90-ties)
- Max. speed reduced from 100 km/hr to 80 km/hr, 24/7
- Enforcement 24/7





Results in Overschie

- Traffic emission NO_x: - 15 – 20%.
- Traffic emission PM₁₀: - 25 – 30%.
- Improvement of total air quality Overschie.
 - NO₂: 7%. (rather low due to background concentrations)
 - Pm₁₀: 4%.



Quick scan to determine optimal speed limit – perhaps 90 or 100 km/h is better?

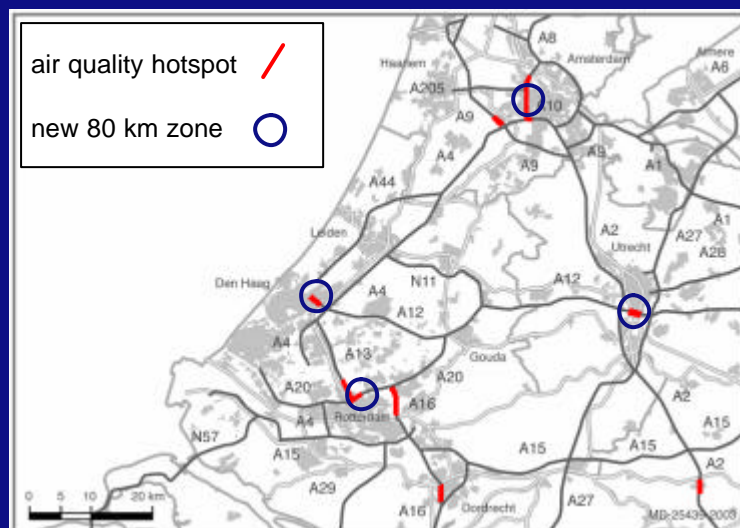
- 80-90-100 km/h limits (with strict enforcement) evaluated, w.r.t.:
 - enforcement
 - traffic flow
 - traffic safety
 - travel time
 - noise
 - air quality
- micro-simulation was used to assess effect of lower speed limit with strict enforcement (based on measured data)
- → 80 km/h speed limit was chosen over 90 or 100 km/h

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Hot spots local air problems / new 80 km zones

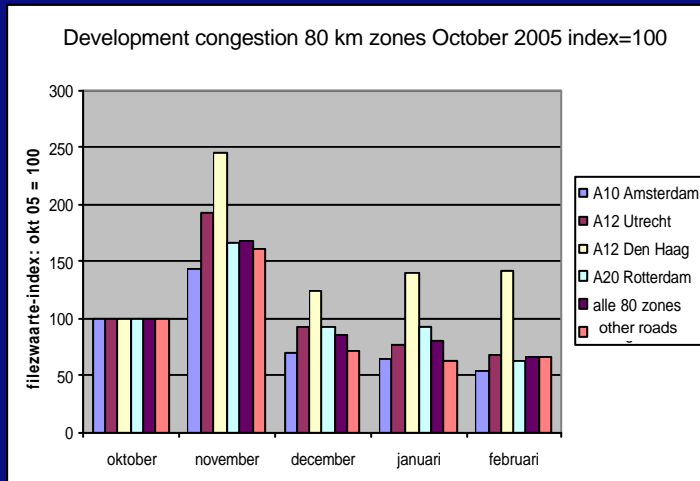


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Unexpected result: extra congestion!



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Projects to analyse effects 80 km zones

- Workshops to observe and discuss driving behaviour at 80 km zones The Hague and Rotterdam
- In addition, a road scene analysis was carried out
- Results:
 - conclusions w.r.t. cause of extra congestion
 - suggestions for improvement
 - long-term
 - short-term

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A12 Den Haag

Amsterdam



Delft,
Rotterdam



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Result 80 km zone A12 the Hague

- More congestion
 - 20-100% more congestion compared to other 80 km zones
- Estimated to result in more air pollution during the peak
- (However, measurements of concentrations NO_x and PM₁₀ at hotspot location indicate positive effect despite increased congestion → more gained outside peak hours than lost during peak hours)

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Why more congestion at this specific location?

- This is a location where weaving takes place.
 - The behaviour of road users has changed due to the introduction of 80 km/h
 - Increase of driving task load due to combination of weaving and speed management
 - The speed has been homogenized extremely, resulting in congestion
 - Weaving becomes difficult due to task of maintaining speed and rather short weaving sections
 - Less flexibility of drivers results in fewer suitable gaps for weaving

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Scenes from the morning peak on the A4/A12, The Hague

Complex situation with illegal use of hard shoulder and lots of weaving



Queue on the exit



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Conclusions

- At complex weaving sections, a speed limit of 80 km/h with strict enforcement may result in reduction of capacity
 - because of changes in driving behaviour (weaving, use of left lane)
- Long term suggestions:
 - check whether section can handle lower speed limit + enforcement
 - apply higher speed limit (if enforcement desired)
- Short term suggestions:
 - change road markings and signs to better guide traffic
 - educate drivers (to use 'fast' lane, to not drive too slow)



Dynamic speed limits

- What can be done with dynamic speed limits in Netherlands?
- Reason for project:
 - not easy to implement/remove measure like 80 km zone (legal issues)
 - new equipment will slowly replace old equipment
- Project started up to explore:
 - examples of variable/dynamic speed limits
 - deployment in time and space
 - trigger-measure effect combinations
 - work towards pilot projects



Examples

- Examples of dynamic speed limits were collected from all over world, for different triggers, mainly:
 - high traffic volumes
 - safety
 - weather
 - air quality, noise

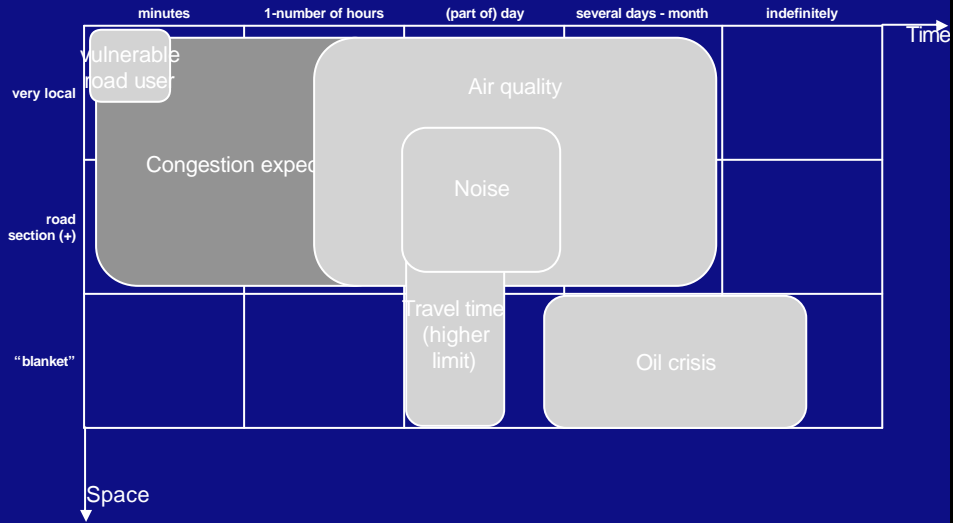


Complete list of triggers for measures

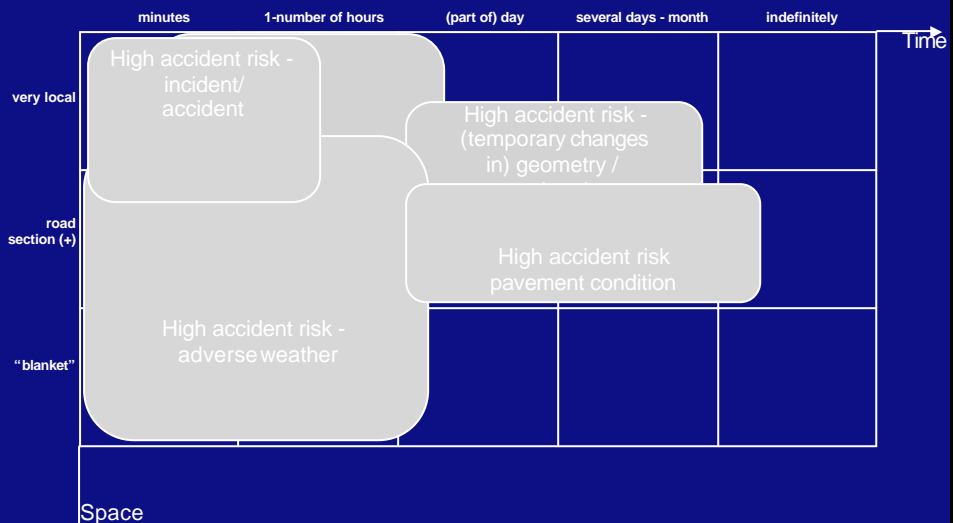
- Throughput / expected congestion
- Shorter travel times
- High accident risk because of:
 - high traffic volumens
 - geometry
 - road works
 - adverse weather
 - pavement condition
 - incident/accident
- Air quality
- Noise
- Intersections / vulnerable road users
- Oil crisis



Deployment in time and space



Deployment in time and space (cont'd)



Conclusions

- 80 km zones: surprising results
- Experiences useful when implementing more measures, with more flexibility → take possible changes in driving behaviour into account
- Pilot projects with dynamic speed limits in the Netherlands expected in near future

