Sustainable Urban safety in the Netherlands

Dr H.L. Stipdonk

Lisbon, March 14th, 2017

SWOV
INSTITUTE FOR
ROAD SAFETY RESEARCH

Henk Stipdonk, SWOV

Expertise — physics, traffic theory, navigation safety, road safety, data, analysis

Team — data-experts, civil engineers, psychologists, mathematicians, …

Projects — Pendant, SafetyNet, DaCoTA, SafetyCube, SaferWheels, SaferAfrica, …
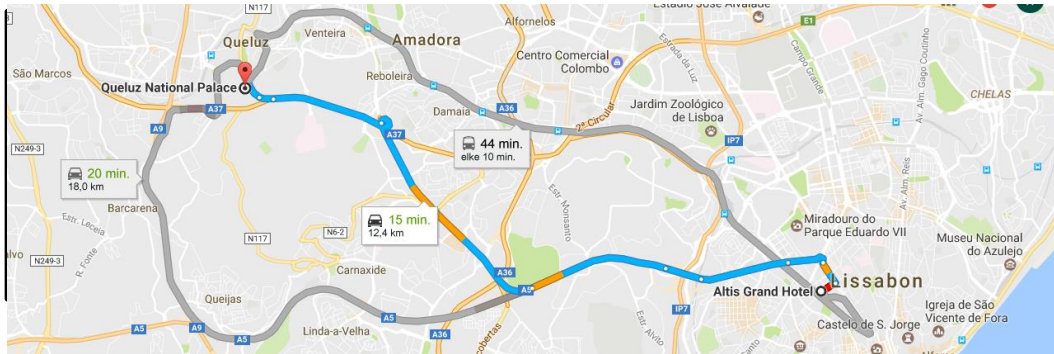
Methods — In depth analysis, data matching, empirical research, instrumented bicycles, …

Data sets — Crashes, mobility, hospital, violations, fleet, driving license, infrastructure, …

SWOV

INSTITUTE FOR
ROAD SAFETY RESEARCH

Risk, distance travelled and casualties

Distance travelled

Casualties (road deaths, serious road injuries)

Risk determined by conditions and properties: **SPI's, measures, factors**

Dominant factor: Vehicle speed & speed difference

SWOV
INSTITUTE FOR ROAD SAFETY RESEARCH

How to achieve safe speeds always, in general?

How to achieve safe urban roads?

Can we train all travellers, until they are perfect drivers, that obey all rules always?

Should we bet on intelligent vehicles that know and obey the speed limit?

Or should we design safe roads that enforce safe speeds?

SWOV
INSTITUTE FOR
ROAD SAFETY RESEARCH

SWOV
INSTITUTE FOR
ROAD SAFETY RESEARCH

A safe system starts with safe roads,
but traffic is not uniform!

# Traffic is not uniform!

Sustainable safety in a nutshell

- As humans are fallible and vulnerable,

- … although **drivers** should know and obey the rules, and enforcement efforts are essential,

- **vehicles** cannot ensure road safety for all, although it certainly helps (and has helped a lot).

- **roads** should be designed to meet the requirements for the road's traffic <u>function</u>.

Urban roads can have two or three functions

Types of urban roads and traffic	Safe travel speed (km/h)
ACCES roads: people live or shop along these roads; front doors; people crossing, children playing. Interactions with pedestrians and two wheelers anywhere.	30 km/h
DISTRIBUTION roads: once on the go, soon we enter the distribution network: higher volumes, interactions with pedestrians and two wheelers at intersections only.	50 km/h
THROUGH roads (larger communities only). Higher speed roads to enter or leave the city. No pedestrians or two-wheelers. Frontal conflicts between cars possible	70 km/h

The design requirement: Safe roads should have a *safe and credible speed limit*, given the function of the road

SWOV
INSTITUTE FOR
ROAD SAFETY RESEARCH

30 km/h roads (urban), some Dutch examples
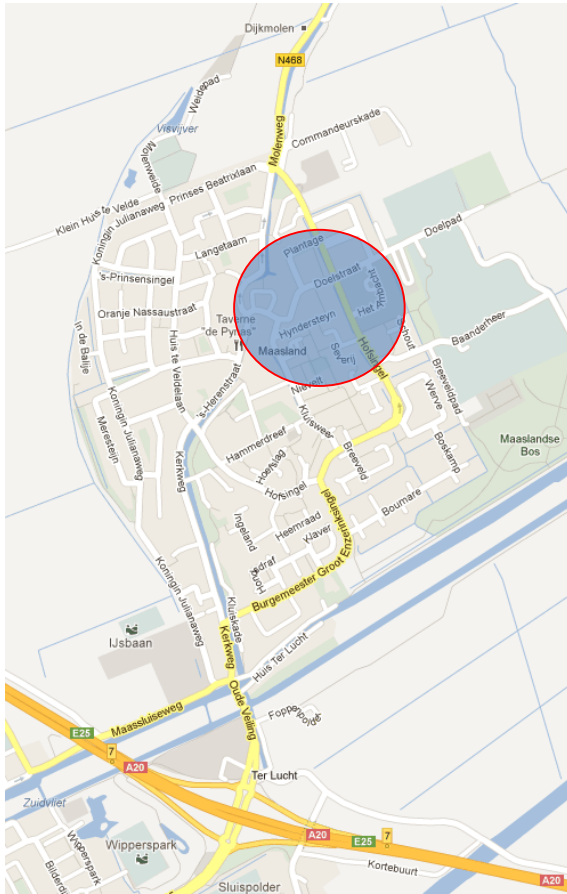
Traffic structures: tree   limited access

30 km/h roads (urban), no credible speed limit

30 km/h roads (urban), properties

	Property	Value	SSA	SaCreD	extra
1	Length of road links	**short**/long		X	
2	Road width	**narrow**/ wide		X	
3	Paving	**pavers**/asphalt	X	X	
4	Street lighting	**low**/high			X
5	Surroundings	**closed**/ open		X	
6	Connections to houses/shops	**yes/**no	X		
7	Road axis marking	**no**/ **special**/ yes	X	X	
8	Road side marking	**no**/ yes	X		
9	Separate lanes	**no**/ yes/ green/ water	X	X	
10	Priority intersections	**no**/ yes/ roundabout/ priority bicycle lane	X	X	
11	Intersection layout	**plateau**/ punaise/ other color/ roundabout/ none	X		
12	Traffic sign installations	**no**/ yes	X		
13	Speed controlling measures	**hump**/ road narrows/ road axix shifts/ none	X	X	
14	Pedestrian crossing possible	**everywhere**/ specific (ZEBRA)/ none			X
15	Pedestrian lane	sidewalk/ **none**			X
16	Bicycle lane	**none**/ coloured pavement/ separate	X	X	
17	Car parking	**parking spaces/ along the road**/ none		X	

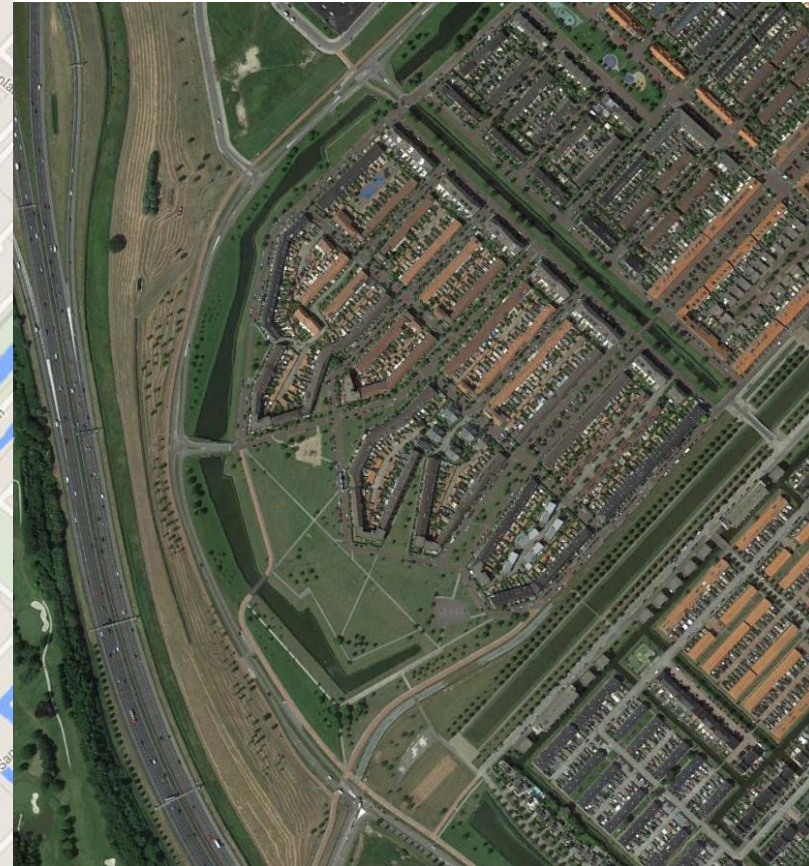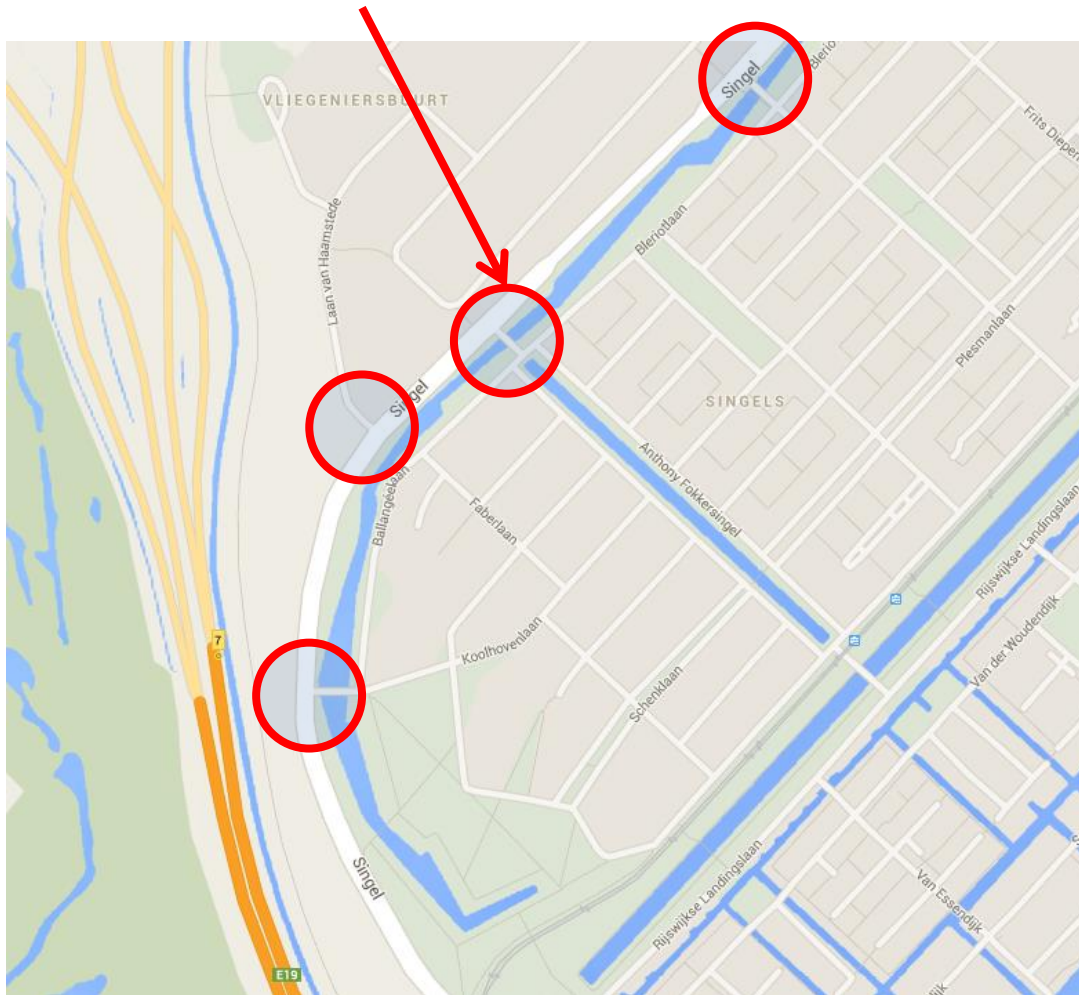# 30 km/h roads (urban), credible speed limit

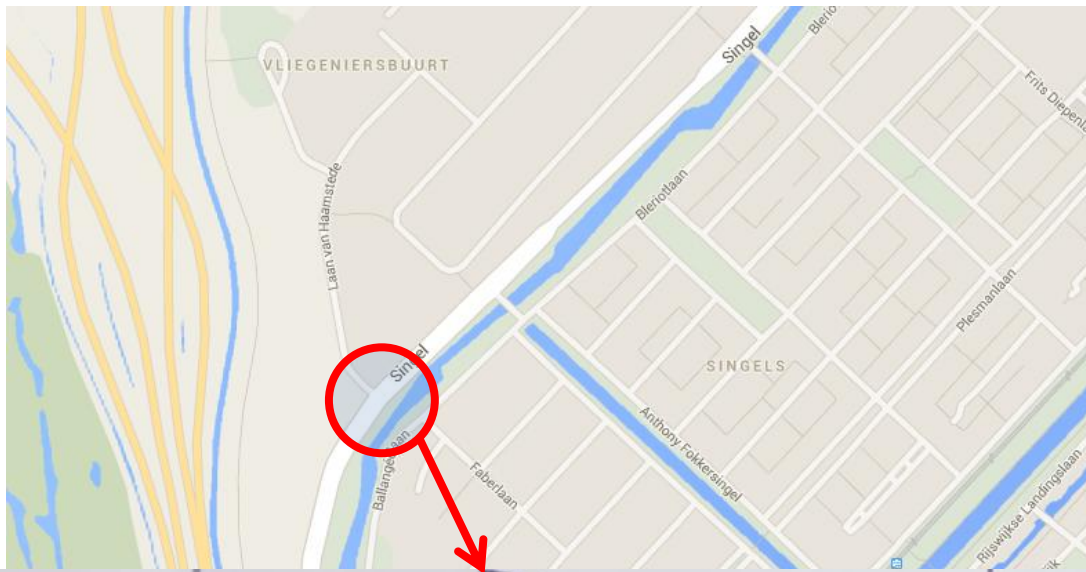# 30 km/h roads (urban), some Dutch examples

50 km/h roads (urban), some Dutch examples

50 km/h roads (urban), with T junctions

Concluding remarks

We can't leave road safety to the road users

Professionals should accept their responsibility

- Roads need to be categorized by their functions
- Speeds should match the road function.
- Road design should enforce those safe speeds and enhance careful manoeuvering
- When road design cannot do the trick, we need enforcement.

SWOV

INSTITUTE FOR ROAD SAFETY RESEARCH