ReVeAL

Regulating Vehicle Access for improved Livability

Ensuring Compliance - Intelligent Speed Assistance (ISA)

8 June 2021

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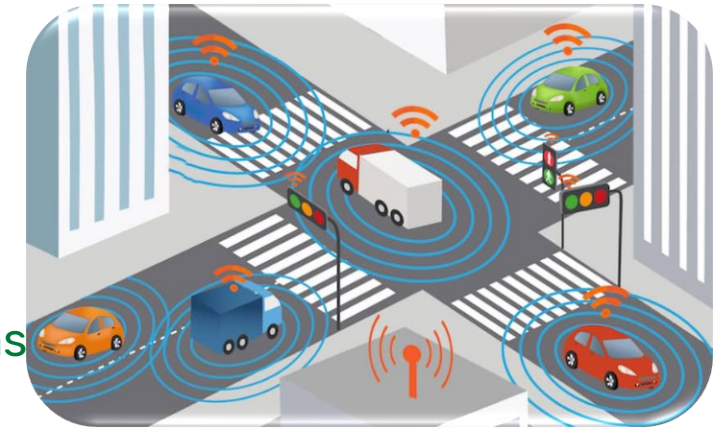
v-tron

YOUR WAY IN INFOMOTIVES

- Headquarters in Deventer
  -> Helmond, Düsseldorf, München

- In-car service provider

- Focus on the aftermarket
  -> We make the outdated vehicle fleet connected with modern solutions



- Active in: Netherlands, Germany, Belgium, France, United Kingdom, Africa, Austria, Switzerland, China

V-tron ISA System

- It is an aftermarket system.
- Designed for the best possible user experience.
- Uses data from a smart camera and a digital HD map.

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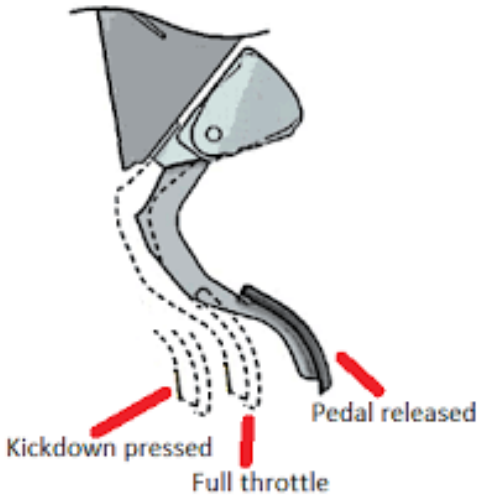
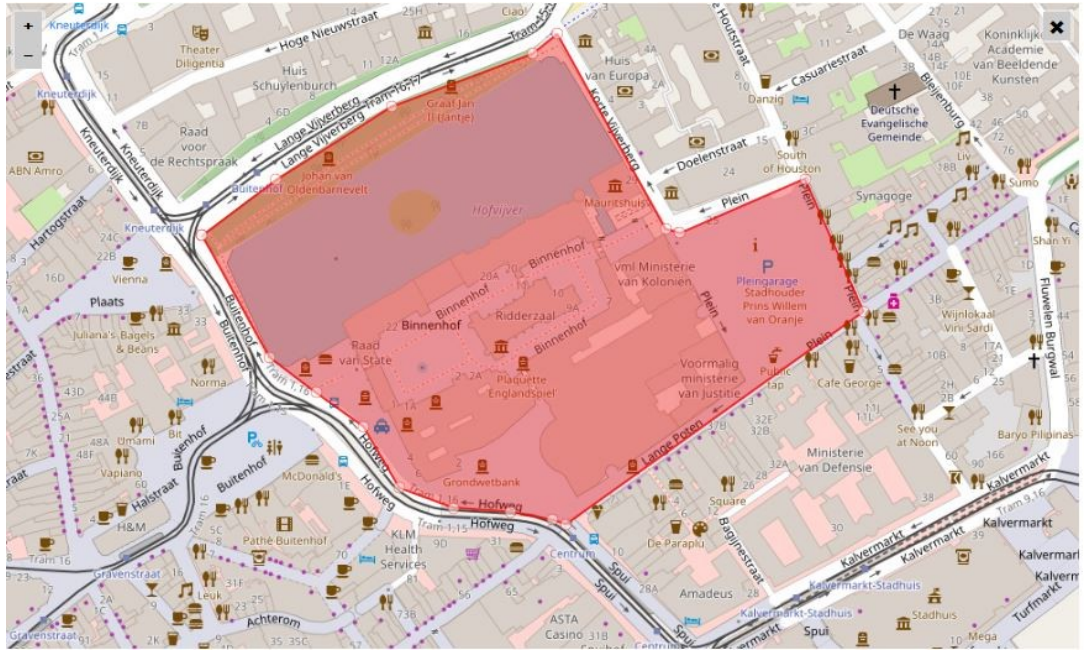


- **Half-open system**
  The system limits the vehicle speed to the applicable maximum speed, s that there is no unintentional speeding. The system can be overruled by pressing the accelerator pedal at 100% for a few seconds. When the accelerator pedal is then fully released, the vehicle is re-limited. With thi system, speeding is a conscious choice.

- **Closed system**
  The system limits the vehicle and the speed can only be overruled by using the emergency button in the vehicle. After successful tests, this emergency button can be built into a smaller and less conspicuous variant.

** When overruling, a notification is sent to the back office.*

- **There is a module built into the digital map within the system to enable Geofencing of the ISA on the digital map.**



- **To make this work everywhere, harmonization at city and European level is needed.**

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Objectives of the ISA test :

- Introduce gradually vehicles equipped with ISA on a defined route :
  -> from 5% of the traffic on the first day to 20 % on the last day
- Assess the impact of this introduction on the traffic speed (average speed, speed violations) on the defined route by comparing it with data collected the week before
- Collect information about the perception of the ISA system by the drivers

The route

- 50 km/h and 30 km/h zone
- Various densities of traffic

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- 10 **cars equipped with ISA** : **speed measurement campaign**
  - Recognition of the road signs through cameras
  - 8 Ford focus
  - 2 V-Tron retrofitted vehicles : 1 VW Up, 1 Toyota CHR (hybrid)
  - Some differences :
    - ISA by default in V-Tron not in the Ford
    - Ford ISA system easy to override (by pushing on the throttle)

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- Organization of **speed measurement campaigns**
  - 6 radars
  - Two weeks of data collection to compare before / after
    - One week before the introduction of vehicles equipped with ISA.
    - During the 4 days of the pilot.

- Preparation of the **operational aspects**
  - Determination of 3 “sub-routes” (loops) to take into account the various densities of the road segments.
  - Definition of an hourly planning for each of the driver on the 3 sub-routes.

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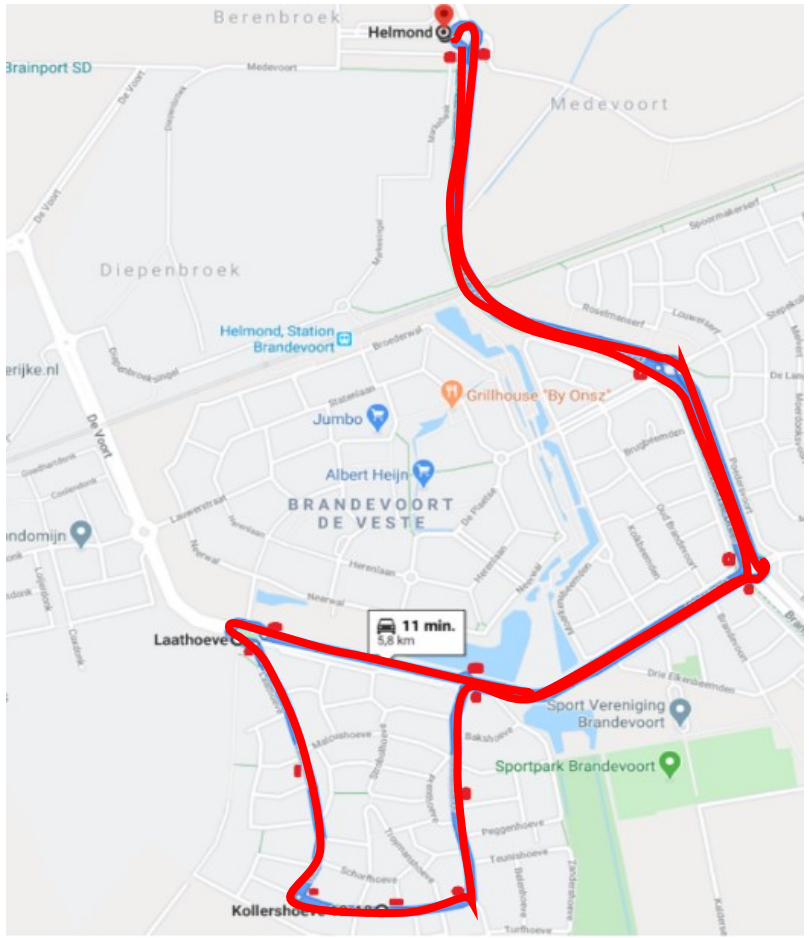
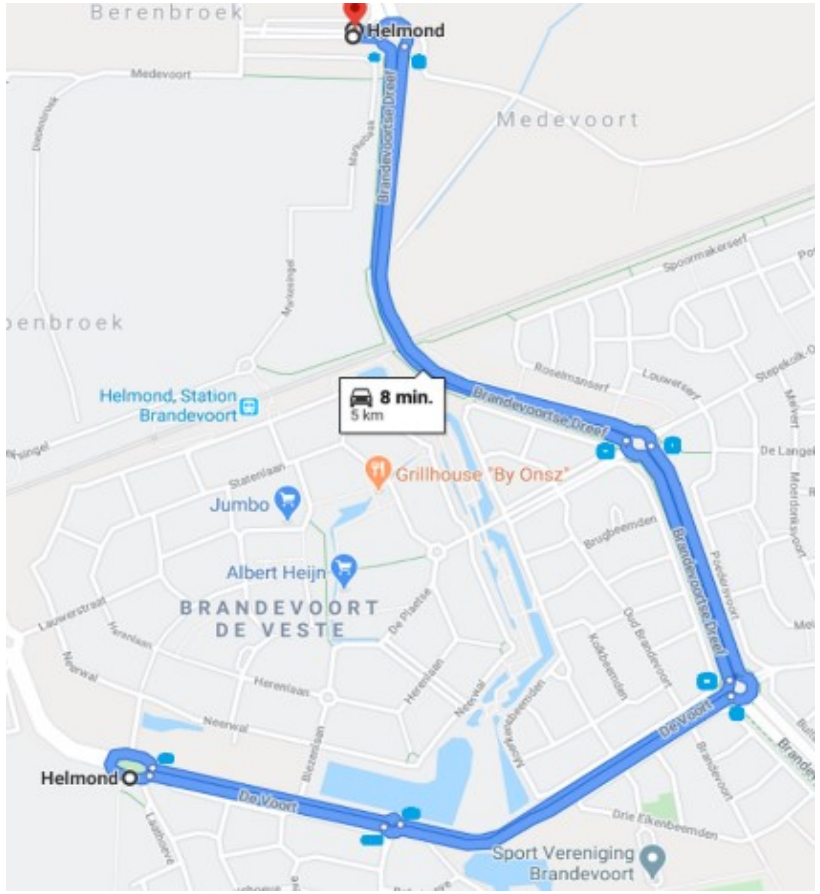
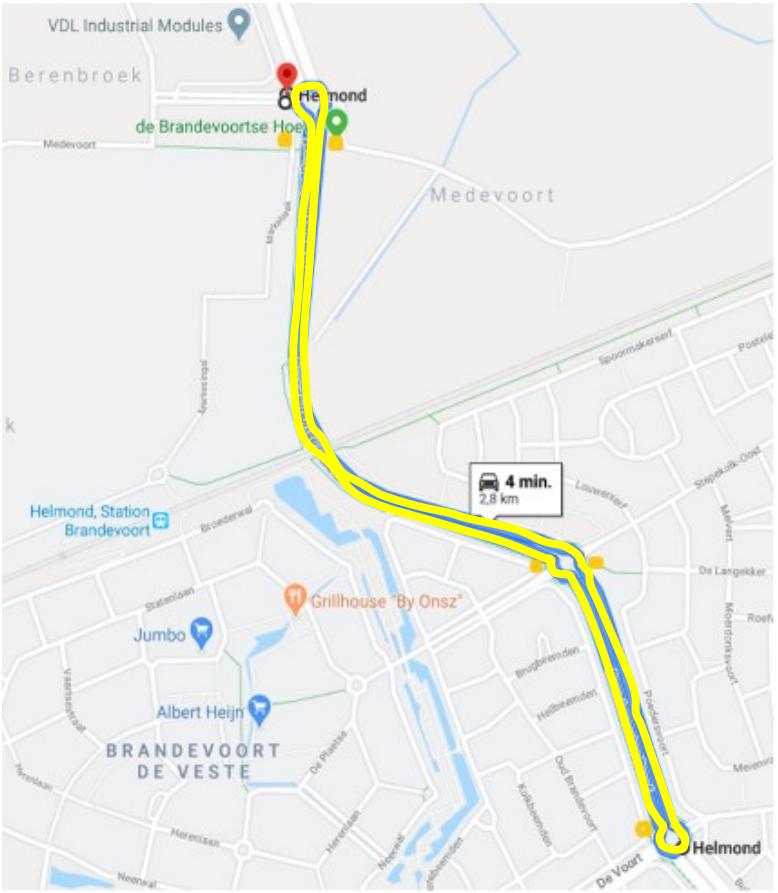
Route 1 complete route



Route 2 intermediate loop



Route 3 Shortest loop



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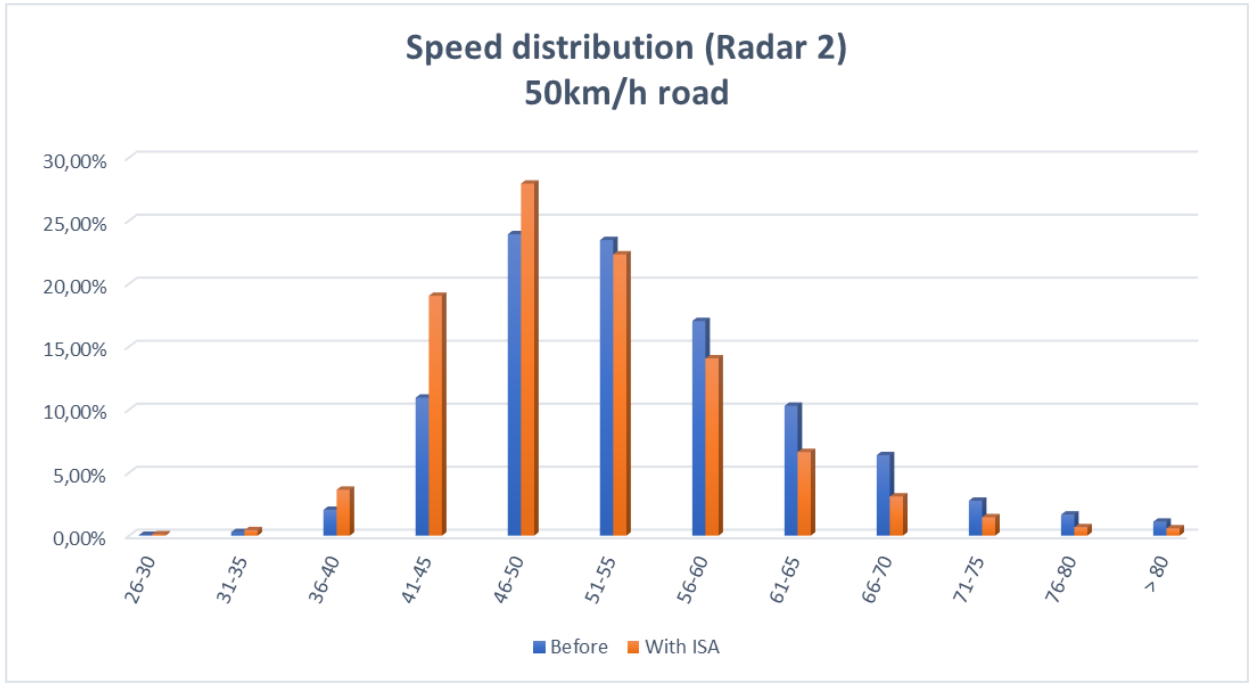
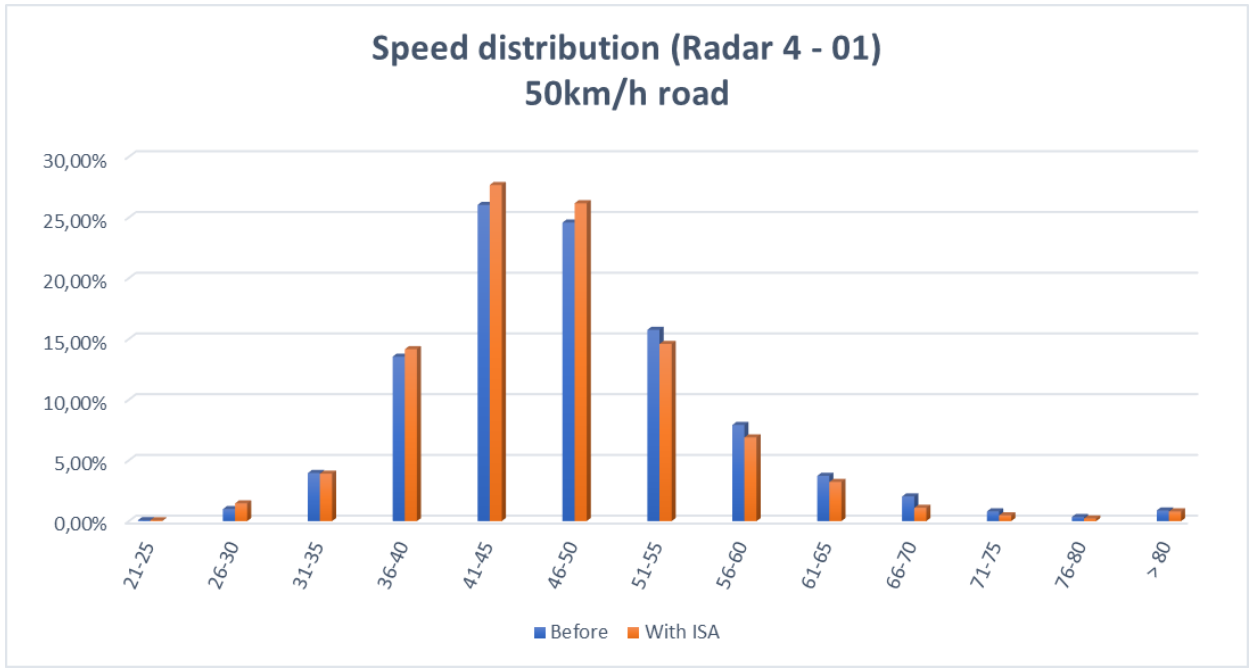
Speed distribution (all vehicles):





Some results on the average speed

Difference in percentage test week relative to week before - Radar 2									
Date / Hours	11	12	13	14	15	16	17	18	Avg:
6-7-2020	-7%	-6%	-11%	-6%	-8%	-9%	-8%	-11%	-8%
7-7-2020	-8%	-7%	-10%	-6%	-7%	-7%	-8%	-10%	-8%
8-7-2020	-2%	-4%	-3%	-7%	-5%	-5%	-3%	-3%	-4%
9-7-2020	-1%	-4%	1%	-4%	-3%	-4%	-4%	1%	-2%
Average:	-4,3%	-5,1%	-5,6%	-5,9%	-5,7%	-6,5%	-5,8%	-5,8%	-5,6%

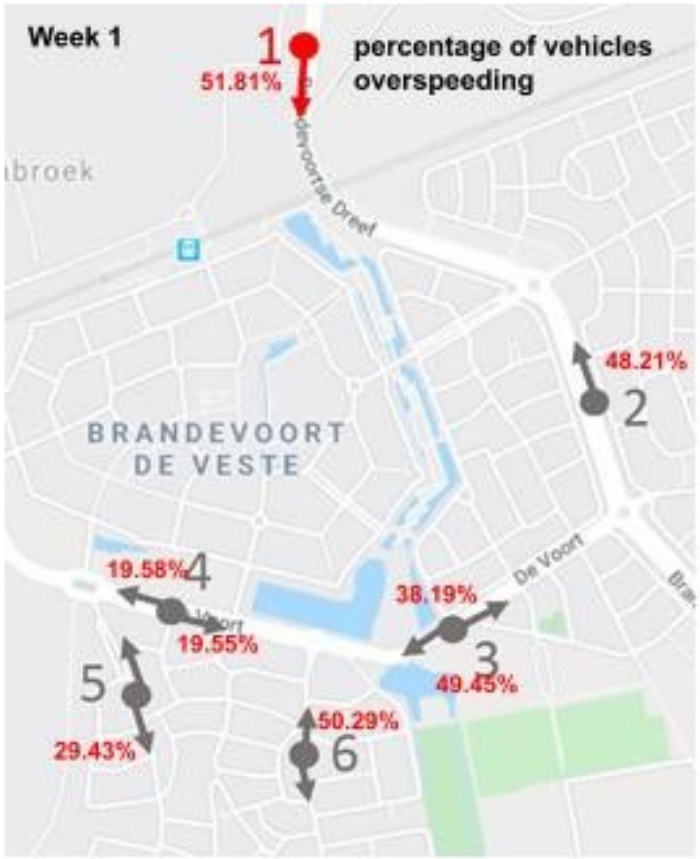
Variation in speed between the baseline week and the ISA test week - Radar 4 towards Laathoeve									
Date / Hours	11	12	13	14	15	16	17	18	Avg:
6-7-2020	1%	-4%	2%	0%	-4%	6%	0%	-5%	0%
7-7-2020	-5%	-4%	-2%	1%	1%	-1%	-6%	-5%	-3%
8-7-2020	-5%	-2%	-3%	-1%	-2%	-4%	-1%	-3%	-3%
9-7-2020	0%	-1%	-1%	-2%	-2%	2%	-3%	-4%	-1%
Average:	-2,1%	-2,6%	-0,9%	-0,4%	-1,6%	0,6%	-2,6%	-4,5%	-1,8%

Variation in speed between the baseline week and the ISA test week - Radar 4 towards Besselhoeve									
Date / Hours	11	12	13	14	15	16	17	18	Avg:
6-7-2020	5%	2%	4%	-1%	0%	1%	0%	0%	1%
7-7-2020	2%	-1%	2%	2%	2%	1%	-2%	0%	1%
8-7-2020	0%	-1%	1%	-1%	-1%	-4%	-3%	-3%	-1%
9-7-2020	-1%	-1%	2%	-1%	-1%	1%	-2%	-2%	0%
Average:	1,6%	-0,2%	2,1%	0,0%	0,0%	-0,3%	-1,6%	-1,2%	0%

Speeding

50 km/h zone	30 km/h zone
> 54 km/h	> 34 km/h

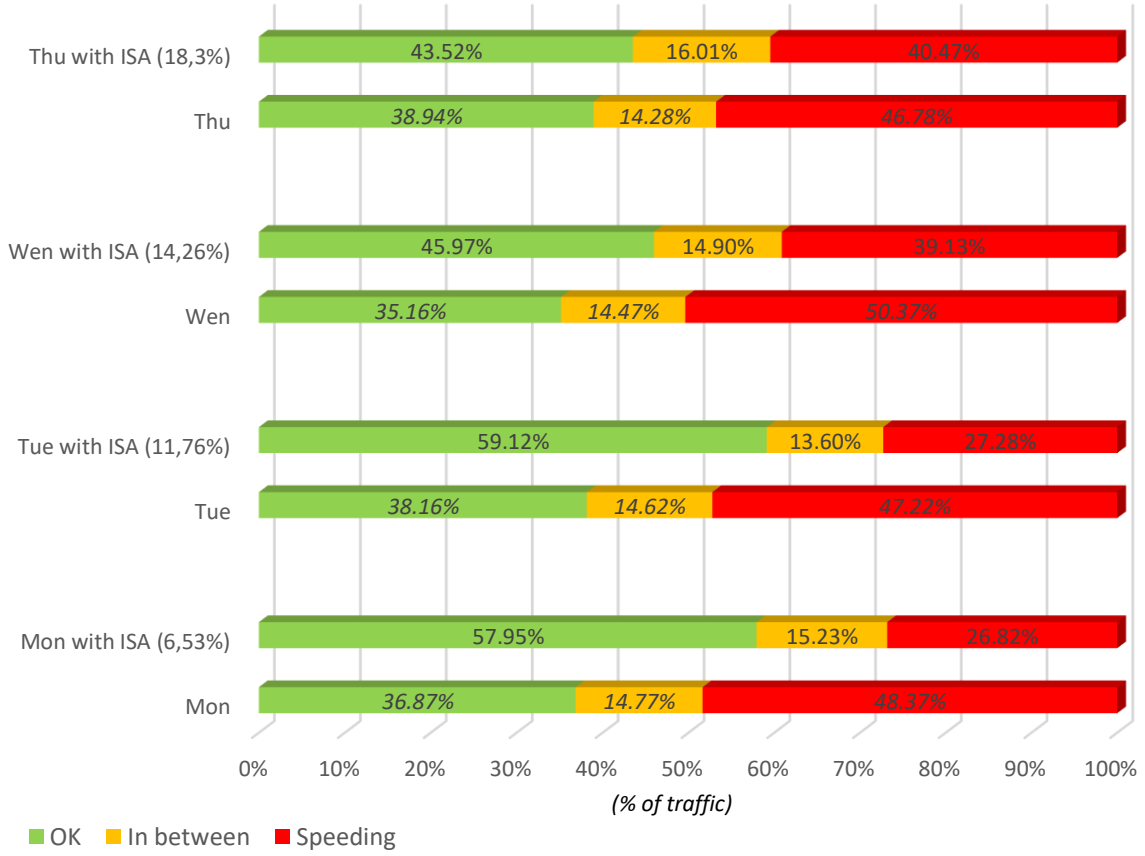
Some results on the <u>percentage of vehicles exceeding the speed limit</u>
<u>(week 1 vs week 2)</u>



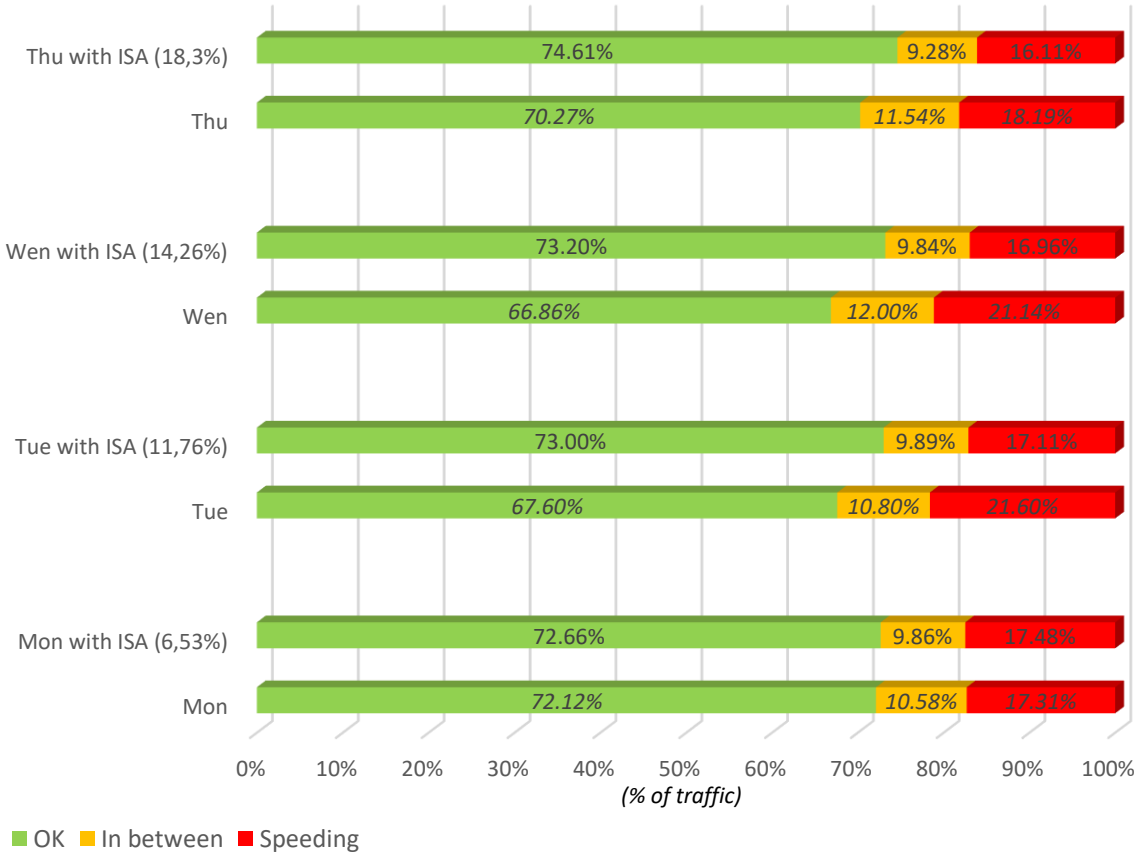
	50 km/h zone	30 km/h zone
OK	0 – 50 km/h	0 – 30 km/h
In between	51 – 54 km/h	31 – 34 km/h
Speeding	> 54 km/h	> 34 km/h

Some results on the percentage of vehicles exceeding the speed limit (comparison between week 1 and week 2, same day of the week)

Radar 2 - Comparison between the percentages of vehicle speeding
(week 2 with ISA / week 1, per day)



Radar 4-001 - Comparison between the percentages of vehicle speeding
(week 2 with ISA / week 1, per day)



Some conclusions

Limits of our test:

-> The penetration rate aimed for as that expected to reduce the total number of speeding vehicles could not be reached in average.

-> Not possible to determine which % of vehicles equipped with ISA would be needed to reduce the number of speeding vehicles.

Average speed: Some minor improvements, in some sections

-> In other sections, notably because of the design of the road, no improvement can be noticed on the average speeds

Peak speed: some interesting results on the roads with the most dense traffic

-> Adaptation of the behavior of the drivers, less inclined to sudden acceleration

Percentage of vehicles exceeding the speed limit

-> ISA system had a stronger impact when the density of the traffic was rather high (the most occupied sections of the route, MP 1 & 2) and where the actual penetration rate was close to the targeted one.

-> Road infrastructure adaptations (speedbumps) had an impact. If there is a large deployment of vehicles equipped with ISA, these kind of road infrastructure adaptations will probably be less needed in the city.

Some conclusions

UVAR:

-> ISA can be a requirement for gaining an access permit for UVARs such as traffic limited zones, or as a requirement for taxi or bus licenses where speed and road safety are a concern, and achieve a high level of speed compliance.

Thank you for your attention

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