

## Second newsletter: Testing tyre-pressure measuring system on the A16 highway (Breda-Rotterdam)

20 September 2018

### From dual tyres to single tyres

We want to reduce the number of incidents with truck tyres caused by punctures or low pressure. The Canadian supplier of the measuring system deployed on the A16 motorway from Breda to Rotterdam, International Road Dynamics (IRD), has a lot of experience with vehicle and tyre configurations that are typically used in North America. It has been proven that the system detects deviations in dual tyres with a sufficient degree of reliability. In the coming months the project will be expanded with the detection of deviations in single and super-single tyres as well. In the nearby future we will also start informing the drivers of the trucks or trailers concerned about any observed deviations. This way, the owners of the vehicles can take appropriate measures more quickly.

### Results of the first four months

The system has been measuring deviations in dual tyres for four months now. Based on the experiences of IRD and the responses we received, it was found that a deviation means that the tyre virtually has no pressure anymore. Two of the reports showed that in reality the tyres did have sufficient pressure, in contrast to the detection of the measuring system. In these cases measurements were concerned where only half of the truck passed over the measuring system. On a weekday, an average of 60 deviations were detected in dual tyres. During a full day, a total of about 20,000 vehicles is checked on the right lane. On a weekday the number of trucks is about 8,000 while this number drops to 3,000 trucks per day during the weekend.

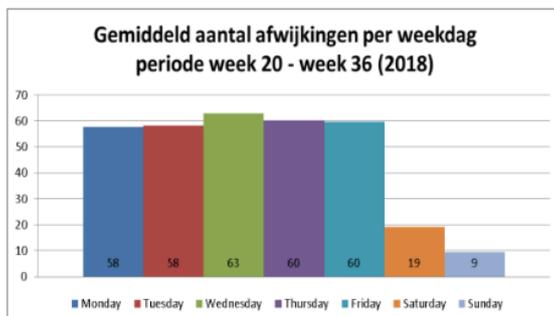


Figure 1: Average number of deviations per weekday during the period between week 20 and week 36 (2018)

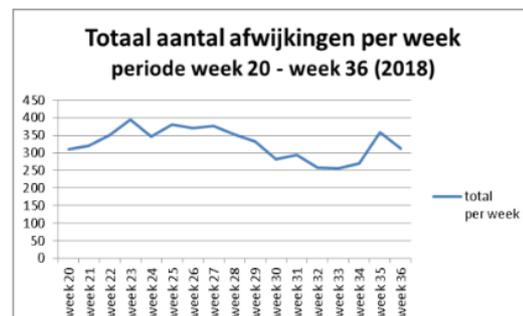


Figure 2: Total number of deviations per weekday during the period between week 20 and week 36 (2018)

### Results action day

At the beginning of the summer period a so-called 'action day' was organized where Profile Tyrecenter and Euromaster selflessly provided support. Because the license plate camera was not available yet, the measurements during the period between 7.00h and 16.00h were done by hand. During this timeperiod 10.957 vehicles passed the measuring system and a flat tyre was detected on

50 trucks with dual tyres. In 30 cases, contact could be made with the owner or the fleet operator and a response was received. For an overview of the results, see figure 3 .

Vehicle type		Kind of transport	
Trailer	6	Garbage	5
Delivery truck	9	Recovery vehicle	1
Motor truck	5	Delivery truck	3
Semitrailer	11	Building materials	9
Lorry	19	Dumptruck	1
<b>Total</b>	<b>50</b>	Refrigerated truck	7
		Moving floor	1
		Silo	1
		Special transport*	12
		Bulk cargo	5
		Tank	1
		Rental container	1
		Sea container	3
		<b>Total</b>	<b>50</b>
Land van herkomst			
Netherlands	40		
Foreign	10		
<b>Total</b>	<b>50</b>		

Figure 3: The results of the action day.

great improvements were made to the system. It now seems more likely that it will be possible to measure low pressure in single tyres with a high reliability. The differences in distributions of some of the points is too high, however, to go 'live'. In short, more calibration tests will be done in the coming period to complete the measuring algorithm.

### Detection of low-pressure tyres

The next step in the development of the measuring system is the detection of (single) tyres with low pressure. To this end, the Canadian manufacturer IRD uses, among others, measurements carried out by this project in a Dutch workplace. The 'footprints' of a prepared vehicle are mapped. These static measurements are then supplemented with measurements of the system deployed on the A16 highway and of systems in North America. A recent interim report states

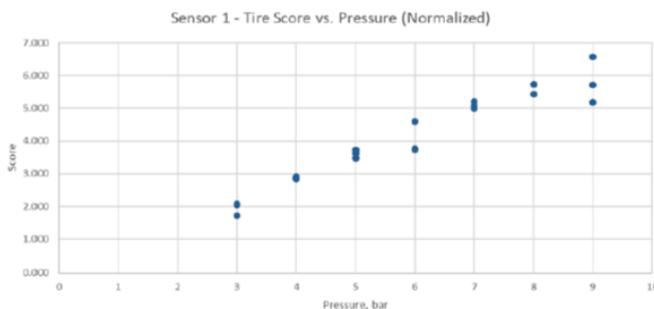


Figure 4: Scatterplot of the measurement results.

### Automatic dispatch of deviation records

While the measuring algorithm is being developed, there is also time to work on the automatic dispatching of deviation records. During the 'action day' the deviations were manually selected and the vehicle owners were approached through the network. This way of working has yielded us many insights, but was also very labour-intensive. It is not realistic to continue working in this way. For now the idea is to give companies the option to receive automatic deviation records. This will be done through the detection of license plates that are supplied to us by the companies themselves and then comparing these license plates to the license plates that are reported by the measuring system. When a known license plate is scanned with a deviation, a deviation report will be sent to the corresponding company. The current setup of the A16 highway between Breda and Rotterdam has to be supplemented with ANPR-cameras that measure license plates for the front and back of

\*Special transport includes flatbeds and vehicles transporting machines and other forms of special transport.



vehicles to make this possible. License plates of the vehicles with a deviation will be stored for up to a month, while all other detected license plates are deleted immediately. We will make arrangements with the participating companies about the way in which the drivers are informed.



Resultaat van het "Tyre Anomaly and Classification System" (TACS<sup>TM</sup>) op de A16

Figure 5: Results of the "Tyre Anomaly and Classification System" (TACS) on the A16 highway between Breda and Rotterdam.

#### Colophon

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