Weigh in Motion in the Netherlands

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Ministry of Transport, Public Works and Water Management

Road and Hydraulic Engineering Institute

The Netherlands

EUROPE

Greenland
Jan Mayen
Greenland Sea
Norwegian Sea
Barents Sea
ICELAND
Reykjavik
NORWAY
Oslo
Bergen
Stavanger
Trondheim
Tromsø
Murmansk
Kiruna
Luleå
Oulu
FINLAND
Helsinki
Tampere
SWEDEN
Stockholm
Göteborg
Malmö
Tórshavn
Faroe Islands (DENMARK)
SHETLAND ISLANDS
ORKNEY ISLANDS
HEBRIDES
North Atlantic Ocean
North Sea
Baltic Sea
DENMARK
Copenhagen
Aalborg
ÅLAND ISLANDS
Tallinn
ESTONIA
RUSSIA
St. Petersburg
Moscow
Arkhangel'sk
LATVIA
Riga
LITHUANIA
Vilnius
Minsk
BELARUS
Kaliningrad
Gdańsk
UNITED KINGDOM
Dublin
IRELAND
London
Manchester
Liverpool
Birmingham
Cardiff
Edinburgh
Celtic Sea
Amsterdam
Rotterdam
Hamburg
Bremen
Berlin
Szczecin
Warsaw
POLAND
Wrocław
Kraków
Kiev
UKRAINE
Lviv
Leipzig
GERMANY
Frankfurt am Main
Stuttgart
Munich
Prague
CZECH REPUBLIC
SLOVAKIA
Bratislava
Vienna
AUSTRIA
Budapest
HUNGARY
Cluj-Napoca
MOLDOVA
Chisinau
ROMANIA
Bucharest
Constanța
Black Sea
Luxembourg
Paris
Strasbourg
Nantes
Bay of Biscay
FRANCE
Lyon
Bordeaux
Marseille
Nice
Turin
Milan
Venice
Florence
Rome
Naples
Palermo
Cagliari
Sardinia
Corsica
Ljubljana
Zagreb
CROATIA
Belgrade
Serbia
Sarajevo
BULGARIA
Sofia
Skopje
Podgorica
Tirana
Thessaloniki
Istanbul
TURKEY
GREECE
Athens
Adriatic Sea
Aegean Sea
Ionian Sea
Tyrrhenian Sea
Ligurian Sea
Bilbao
PYRENEES
Zaragoza
Madrid
Barcelona
PORTUGAL
Lisbon
SPAIN
Valencia
Sevilla
Málaga
BALEARIC ISLANDS
Mediterranean Sea
Algiers
Oran
Tunis
Sfax
Sousse
Tripoli
Benghazi
Valletta
MALTA
Rabat
Casablanca
MOROCCO
ALGERIA
TUNISIA
Scale 1: 19,500,000
Lambert Conformal Conic Projection,
standard parallels 40°N and 50°N

WIM-system

Mrs Tineke Netelenbos

Minister of Transport, Public Works and Water Management

... the Netherlands will get the 'smartest motorways of Europe' ...

WIM-system

- Circa 15% of all freight vehicles in NL is overloaded.
- One or more axle loads are higher than permitted.

WIM-system

Overloading:

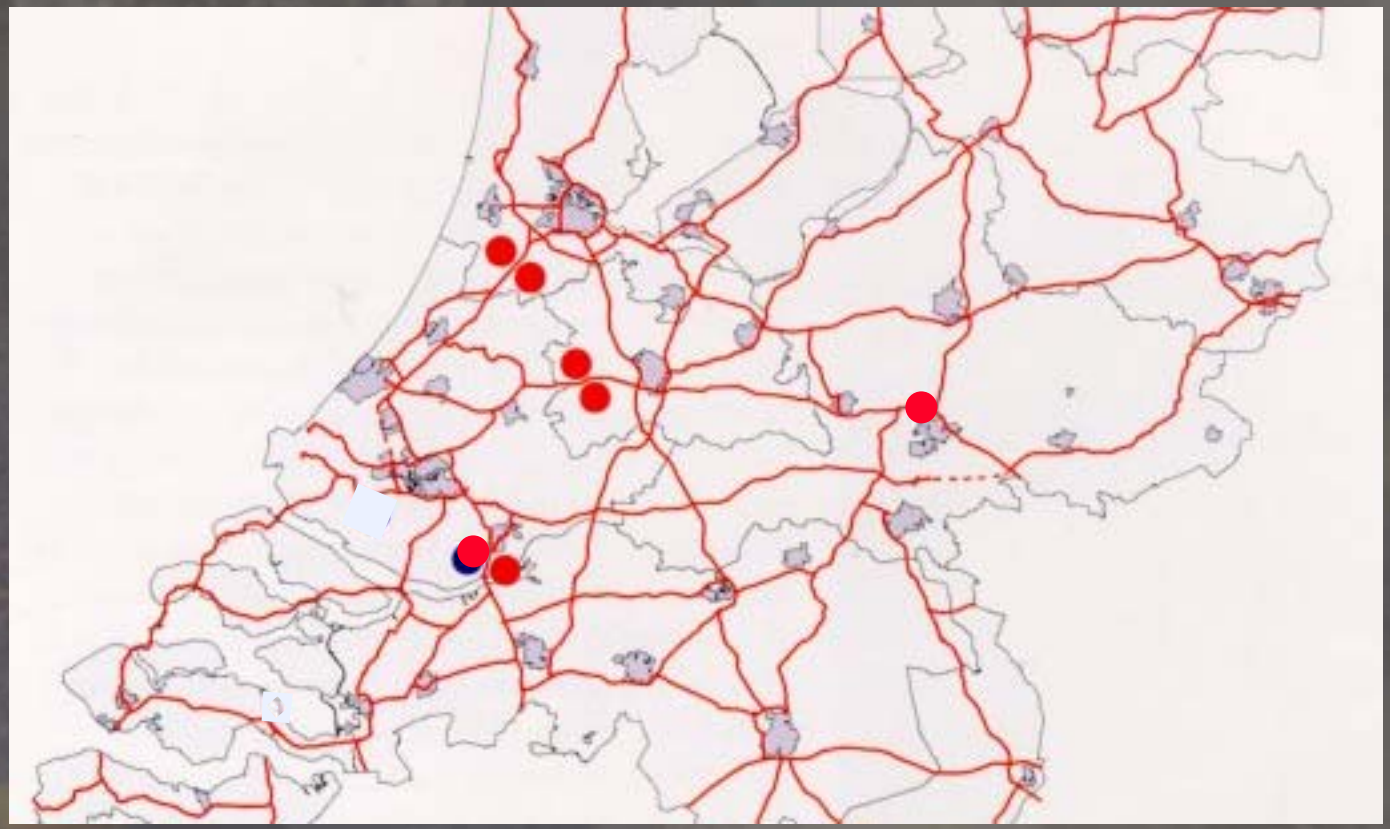
- Means unfair competition
- Leads to disproportionately extra damage on roads
- Leads to extra traffic jams caused by maintenance activities
- Leads to unsafe traffic situations

WIM-system

On 7 June 2001 the Netherlands made a start up with the approach of overloading by use of WIM-systems

WIM-system

On 7 sites in the motorway-network there are WIM-points:



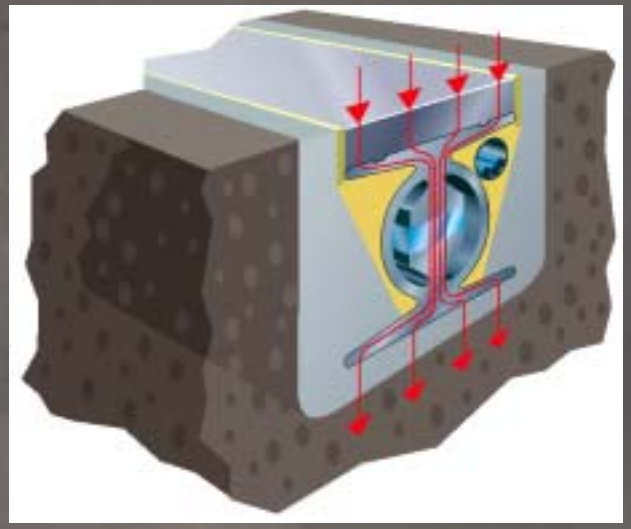
afrit 13
1200 m
Nieuwerbrug
Waarder
Driebruggen
Weegpunt

WIM-system

Axle load sensors and induction loops are installed in the road surface

WIM-system

In the Netherlands per lane there is used a double row of the Kistler Lineas sensors



WIM-system

If a passing truck is overloaded also pictures are made

By the use of infrared illumination this will also be done at night

WIM-system

Camera's above the lanes make digital images of the licence plate, and - if present – an image of the hazardous goods plate

WIM-system

Camera’s along the road side are making digital colour images of the complete vehicle

WIM-system

Trucks driving on the 1st overtake lane and the hard shoulder are also registered.

WIM-system

The users of the WIM-systems in NL are:

- The Motorway Police
- The State Traffic Inspectorate
- The Ministry of Transport

WIM-system

The police uses the system as a pre-selection tool.

WIM-system

By means of a live-connection with the WIM-roadside-system the overloaded trucks are presented to the police on a computer screen.

WIM Monitor RW16;km41,5;oostbaan;'s-Gravendeel

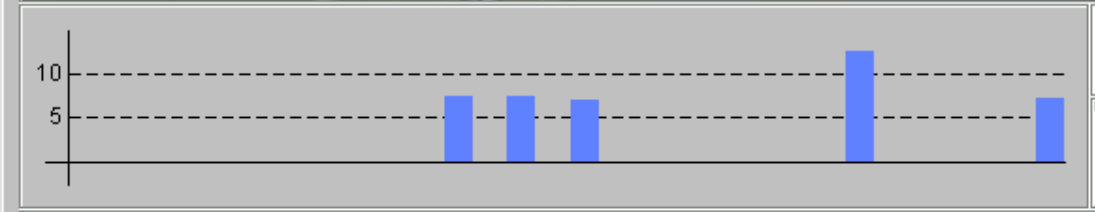
Bestand Verbinding Tools Help

Ministerie van Verkeer en Waterstaat
Rijkswaterstaat

Mode: Handmatig

Datum:	11-10-2001
Tijd:	12:32:13
Voertuig #:	192305
Rijstrook:	Rechter rijstrook
Sub Categorie:	T11O3
Snelheid (km/uur):	89
Totaal gewicht (ton):	42,3
Lengte (m):	15,52
Aantal assen:	5
Kenteken:	

As	Asdruk (ton)	Afstand (m)
As 1	7,3	-
As 2	12,8	3,82
As 3	7,2	5,52
As 4	7,5	1,31
As 5	7,5	1,27



. Geen G.S. uitsnede beschikbaar

Aantal nog te verwerken registraties: 1

WIM-system

A police vehicle intercepts the truck and directs it to the static weighing location a few km's further on

WIM-system

On this location the truck is weighed static axle by axle.

By means of this measurement an official report is registered.

WIM-system

The State Traffic Inspectorate is provided automatically with the data of all overloaded vehicles that pass the WIM-roadside systems.

By means of the image of the licence plate is looked for the freight company (owner of the vehicle).

BV - XX - 43

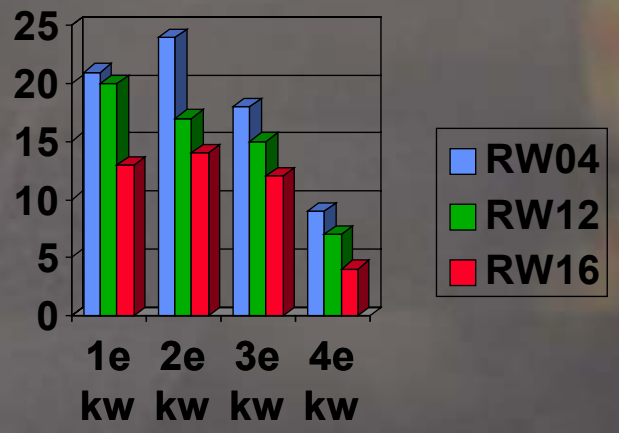
WIM-system

Inspectors will visit these companies to assist them to find in a cooperative way solutions for their 'overloading-problems'.

WIM-system

The Ministry of Transport

- Manages the systems
- Uses the systems as a tool for research
- Develops new systems



WIM-system

The Ministry of Transport will use the data of the WIM-system to get more information about the loading of their road network.

This information can be used for future road design and road maintenance activities.

WIM-system

In the future, the number of WIM-systems will be expanded to a national WIM-network on the main road network.

WIM-system

By means of this WIM-network the Ministry of Transport has an effective tool for reducing overloading and all its negative effects.

WIM-system

A few examples from the police-application showing several possible overloaded vehicles in different situations …

WIM Monitor RW16;km41,5;oostbaan;'s-Gravendeel

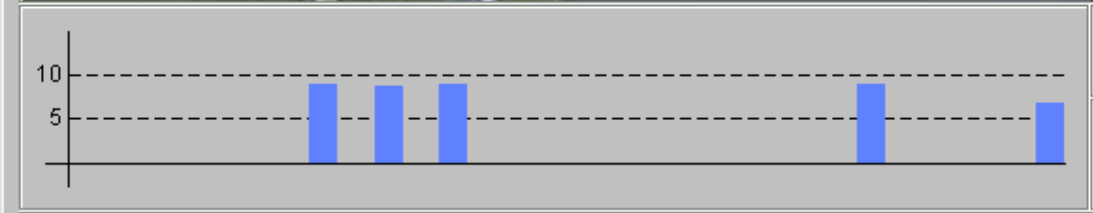
Bestand Verbinding Tools Help

Ministerie van Verkeer en Waterstaat
Rijkswaterstaat

Mode: Handmatig

Datum:	11-10-2001
Tijd:	12:26:56
Voertuig #:	192241
Rijstrook:	Rechter rijstrook
Sub Categorie:	T11O3
Snelheid (km/uur):	88
Totaal gewicht (ton):	42,9
Lengte (m):	17,44
Aantal assen:	5
Kenteken:	

As	Asdruk (ton)	Afstand (m)
As 1	6,9	-
As 2	9,0	3,60
As 3	9,1	8,42
As 4	8,8	1,32
As 5	9,1	1,36



. Geen G.S. uitsnede beschikbaar

Aantal nog te verwerken registraties: 1

WIM Monitor RW16;km41,5;oostbaan;'s-Gravendeel

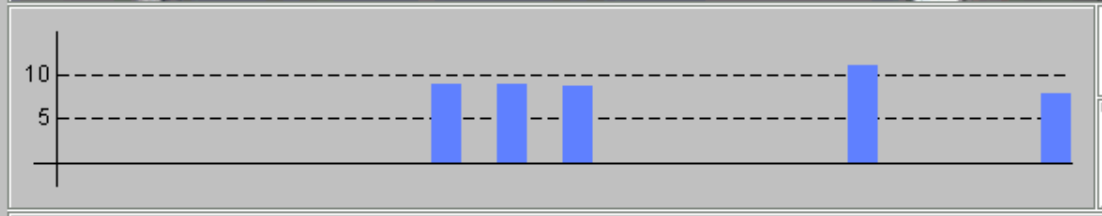
Bestand Verbinding Tools Help

Ministerie van Verkeer en Waterstaat
Rijkswaterstaat

Mode: Handmatig

Datum:	11-10-2001
Tijd:	12:44:07
Voertuig #:	192466
Rijstrook:	Inhaalstr. 1
Sub Categorie:	T11O3
Snelheid (km/uur):	90
Totaal gewicht (ton):	46,5
Lengte (m):	15,63
Aantal assen:	5
Kenteken:	

As	Asdruk (ton)	Afstand (m)
As 1	8,1	-
As 2	11,2	3,83
As 3	8,9	5,63
As 4	9,1	1,30
As 5	9,2	1,31



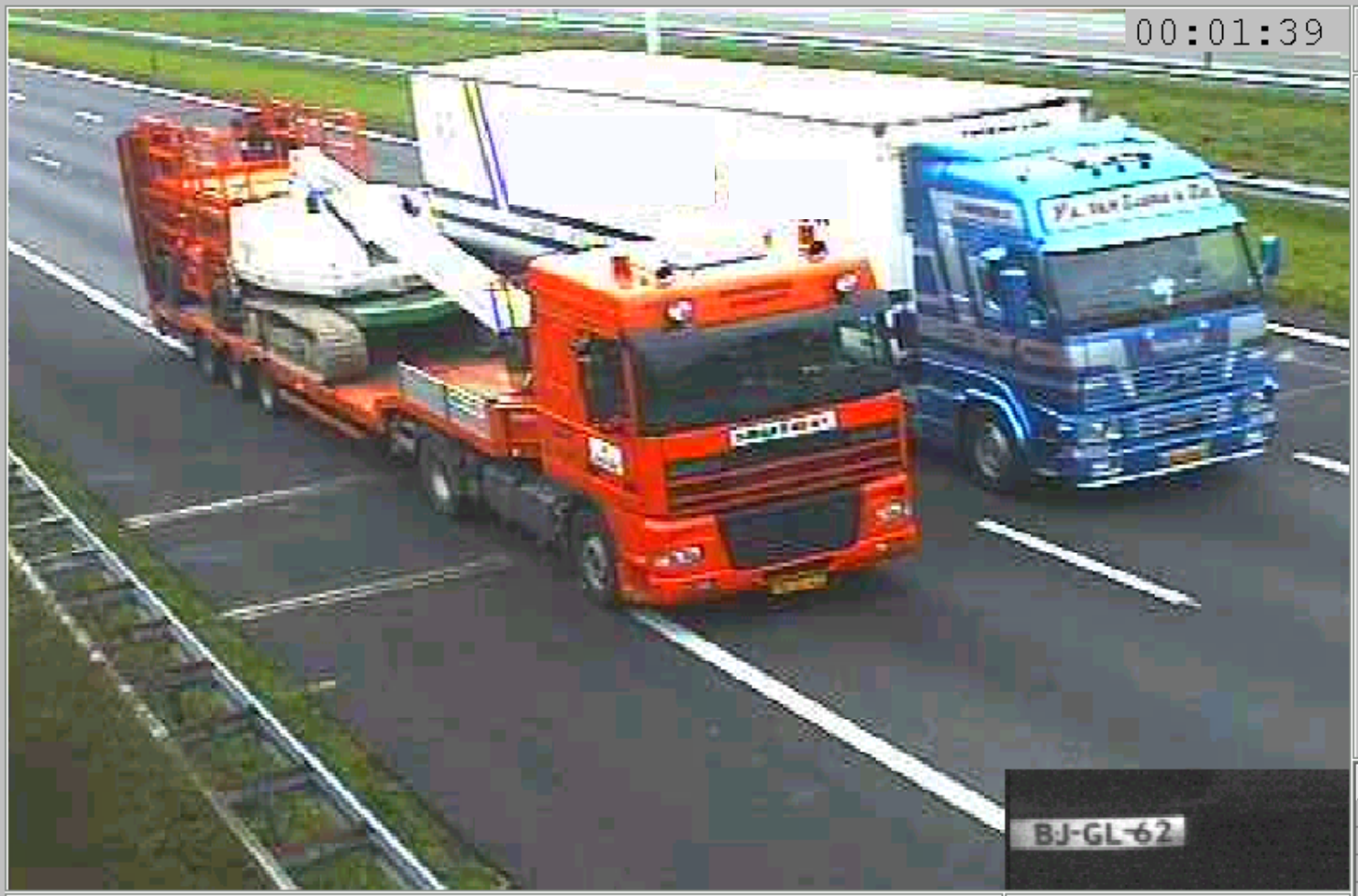
. Geen G.S. uitsnede beschikbaar

Aantal nog te verwerken registraties: 2

WIM Monitor RW16;km41,5;oostbaan;'s-Gravendeel

Bestand Verbinding Tools Help

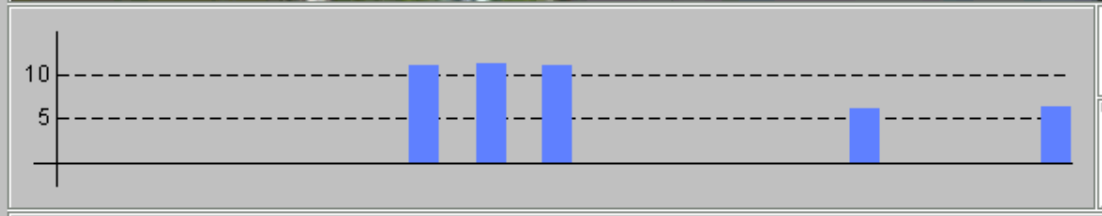
Ministerie van Verkeer en Waterstaat
Rijkswaterstaat



Mode: Handmatig

Datum:	11-10-2001
Tijd:	12:44:07
Voertuig #:	192467
Rijstrook:	Rechter rijstrook
Sub Categorie:	T11O3
Snelheid (km/uur):	84
Totaal gewicht (ton):	47,0
Lengte (m):	17,10
Aantal assen:	5
Kenteken:	

As	Asdruk (ton)	Afstand (m)
As 1	6,5	-
As 2	6,2	3,79
As 3	11,3	6,09
As 4	11,5	1,33
As 5	11,3	1,36



. Geen G.S. uitsnede beschikbaar

Aantal nog te verwerken registraties: 2

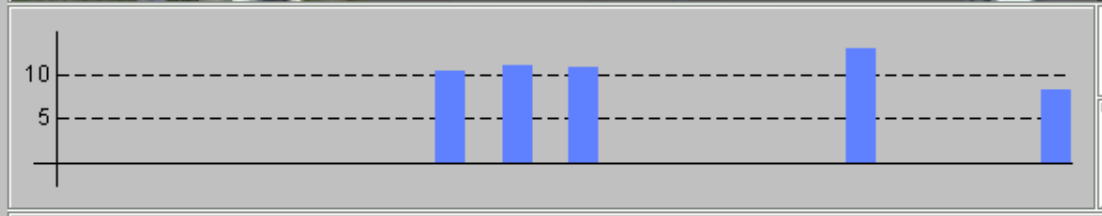
WIM Monitor RW12;km41,8;noordbaan;Woerden

Bestand Verbinding Tools Help

Ministerie van Verkeer en Waterstaat
Rijkswaterstaat

Mode:	Handmatig
Datum:	10-10-2001
Tijd:	16:56:39
Voertuig #:	85117
Rijstrook:	Rechter rijstrook
Sub Categorie:	T11O3
Snelheid (km/uur):	88
Totaal gewicht (ton):	54,5
Lengte (m):	14,92
Aantal assen:	5
Kenteken:	

As	Asdruk (ton)	Afstand (m)
As 1	8,4	-
As 2	13,2	3,87
As 3	11,0	5,49
As 4	11,2	1,33
As 5	10,7	1,35



. Geen G.S. uitsnede beschikbaar

Aantal nog te verwerken registraties: 0

WIM Monitor RW12;km41,8;noordbaan;Woerden

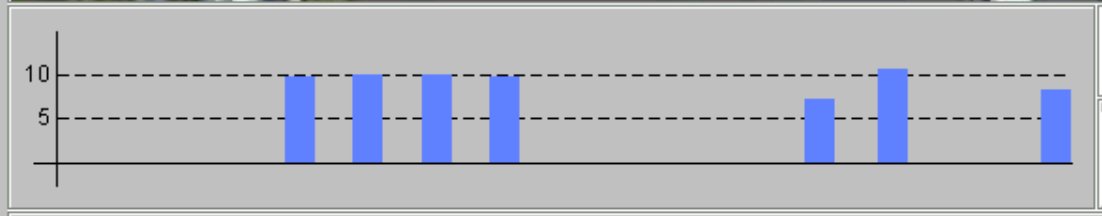
Bestand Verbinding Tools Help

Ministerie van Verkeer en Waterstaat
Rijkswaterstaat

Mode: Handmatig

Datum:	10-10-2001
Tijd:	16:47:38
Voertuig #:	85040
Rijstrook:	Rechter rijstrook
Sub Categorie:	T12O4
Snelheid (km/uur):	86
Totaal gewicht (ton):	67,3
Lengte (m):	18,27
Aantal assen:	7
Kenteken:	

As	Asdruk (ton)	Afstand (m)
As 1	8,5	-
As 2	10,9	3,22
As 3	7,4	1,46
As 4	10,1	6,23
As 5	10,2	1,36
As 6	10,2	1,40
As 7	10,0	1,34



. Geen G.S. uitsnede beschikbaar

Aantal nog te verwerken registraties: 0

WIM Monitor RW12;km41,8;noordbaan;Woerden

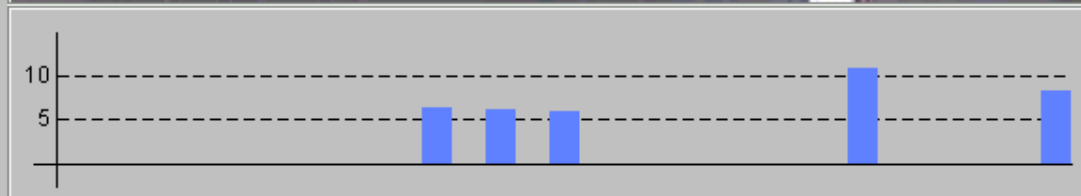
Bestand Verbinding Tools Help

Ministerie van Verkeer en Waterstaat
Rijkswaterstaat

Mode: Handmatig

Datum:	10-10-2001
Tijd:	15:32:55
Voertuig #:	283611
Rijstrook:	Inhaalstr. 1
Sub Categorie:	T11O3
Snelheid (km/uur):	89
Totaal gewicht (ton):	38,5
Lengte (m):	16,01
Aantal assen:	5
Kenteken:	

As	Asdruk (ton)	Afstand (m)
As 1	8,5	-
As 2	11,1	3,82
As 3	6,1	5,91
As 4	6,3	1,28
As 5	6,5	1,29



. Geen G.S. uitsnede beschikbaar

Aantal nog te verwerken registraties: 0

WIM-system

An other development in NL is

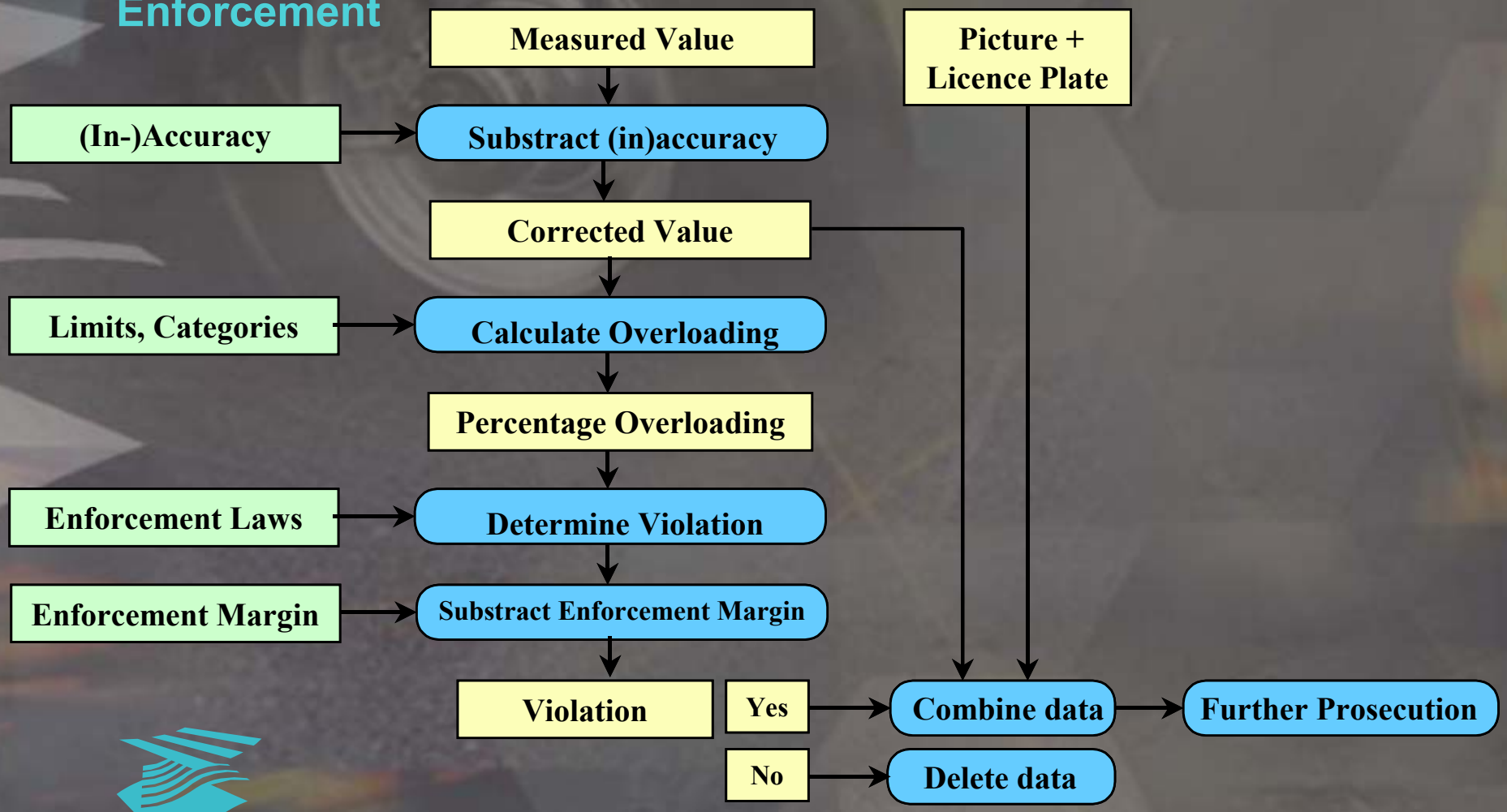
WIM-systems for automatic enforcement …

WIM-system

Development of WIM-systems for automatic enforcement

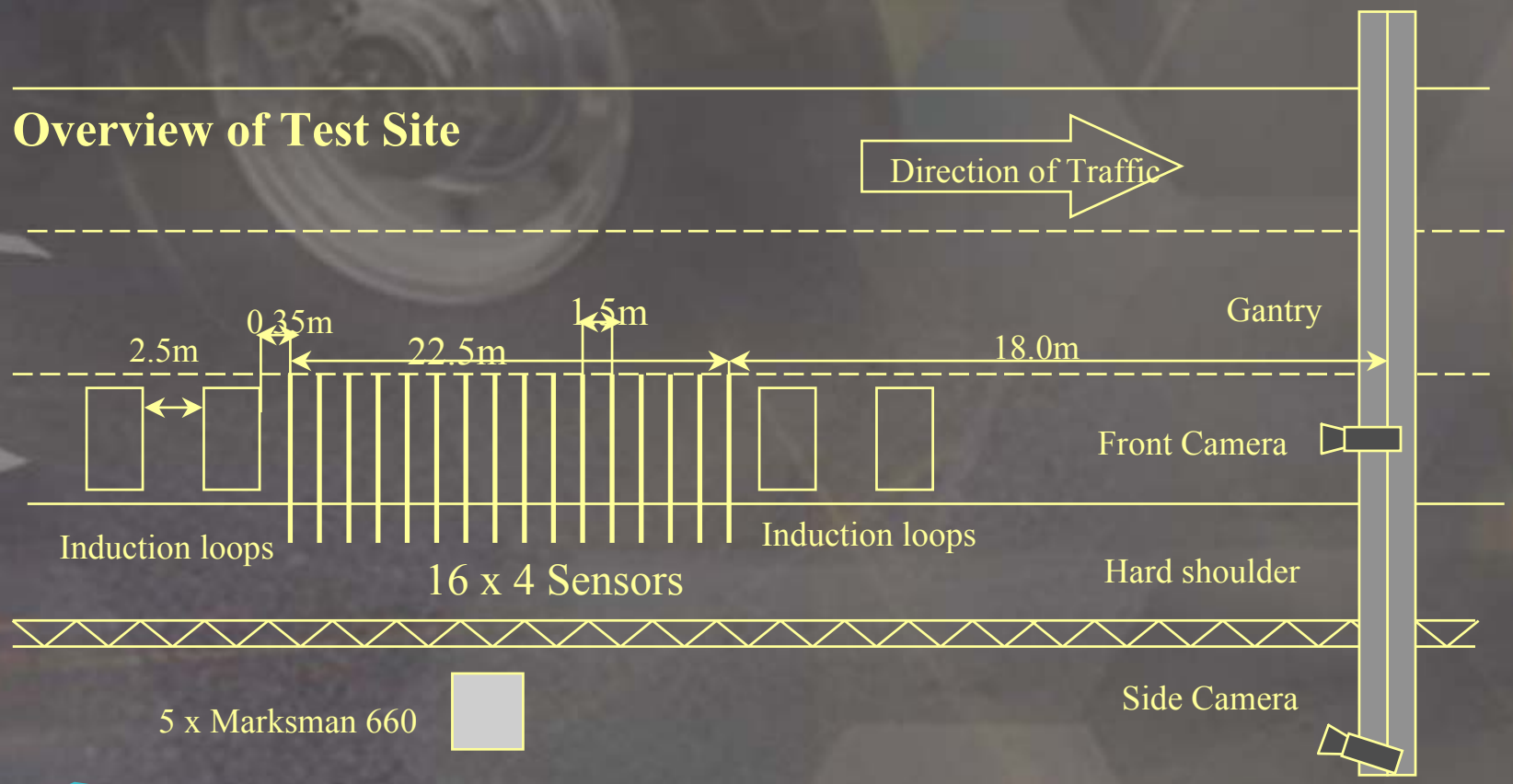
- Procedure for Enforcement
- High Accuracy and Certainty
- HS MS WIM
- Project status
- Open Issues

WIM-system, Procedure for Automatic Enforcement



Ministry of Transport

WIM-system, HS MS WIM



WIM-system, Project Status

- ✓ Design of the System
- ✓ Installation of the System

- ➢ Combination of Measurements
- ➢ Instrumented Vehicle
- ➢ Definition of Test Procedure

WIM-system, Open Issues

- Problems with Sensors
- Classification of Trucks
- Certification
- Organisation
- International exchange