Annex 6

Local Verification Results - Rotterdam

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LOCAL VERIFICATION RESULTS - ROTTERDAM

Indicator 1: Accuracy of DOAS equipment compared with traditional equipment

Introduction

In November 2000, measurements were carried out in an open field location along highway A13 in Rotterdam Overschie within the framework of the HEAVEN project. Three measuring devices were installed in an apartment at a distance of 20m from the baffle board along the road, at a height of 10m. The longest measurement series were obtained with the DOAS system of INERIS, the French partner in the project, and with the NO_x monitor of DCMR. On some days measurements were also collected using the DOAS system of RIVM. During this campaign, measurements were also performed some kilometres north, along A13 in the field (station A1).

Measuring apparatus

The Differential Optical Absorption Spectrometer (DOAS) measures the concentration of polluting substances in the air by determining the absorption of light at certain wavelengths. A light source is installed at the opposite side of the road at a distance of approximately 90m. The monitor in the apartment thus measures the average concentration above the highway. The DOAS from INERIS measured NO, NO_2, O_3, SO_2, benzene, toluene and xylene. It was apparent that the measurements of benzene, toluene and xylene were unreliable and therefore were excluded from this analysis. RIVM measured NO_2, O_3 and SO_2 with its DOAS. The inlet of the NO_x monitor was at the window of the apartment, so concentrations at a distance of 20m from the road were measured.
Station A1 was located at 80m from the road in the field; it utilised the same NO_x monitor as the apartment. This station additionally measured O_3 and benzene.

The RIVM DOAS system

RIVM measured pollution concentrations between 1st - 10th November and reported 225 hourly values for NO_2 with the DOAS system. During this period, station A1 was active for the entire period and 225 hourly values were obtained. The monitor in the flat was only active for 24 hours and the DOAS system used by INERIS was only active for 103 hours during this period. Since RIVM only reported NO_2 concentrations and not NO concentrations, verification was only performed on the NO_2 data. The figure below indicates the concentration variations for all instruments in the period between 1st -10th November 2000.

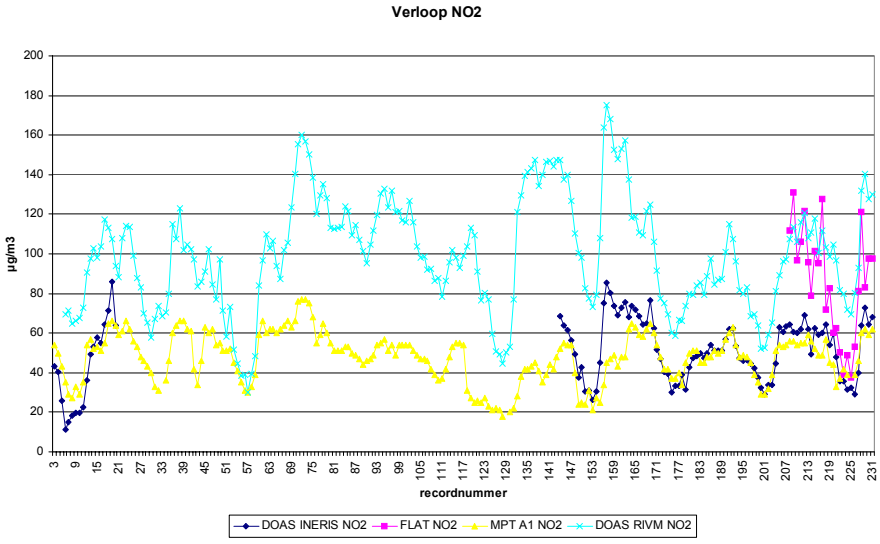

Figure 1: NO_2 data, concentration variations for all instruments in the period

between1st -10th November 2000

Discussion of results

There was not enough data to compare the DOAS system used by RIVM with the NO_x monitor in the flat. Comparison with the monitor at station A1 indicated that the measured concentrations illustrate the same pattern, but the DOAS system reveals higher concentrations than the monitor at A1. This was to be expected, because the DOAS system measured the average concentration in a beam directly above the road, whereas the monitoring station was located at some distance from the road and measured a 'point concentration'. Statistical analysis showed a very poor correlation (r^2=0.27) between the values of the DOAS system and the values obtained at station A1. This does not mean, however, that the DOAS system is unsuitable for measurements in this situation. The similar pattern of the concentration variations and the fact that higher concentrations directly above the road would be expected, lead to the conclusion that the system probably yielded reliable results.

The INERIS DOAS system

The measurements were performed between 31st October -7th December 2000. A total of 725 useable hourly values were obtained from the DOAS system used by INERIS. The NO_x monitors in the apartment and station A1 yielded 144 and 750 hourly values respectively.

The NO_2 concentration variations over the whole of the period are shown in the figure below.

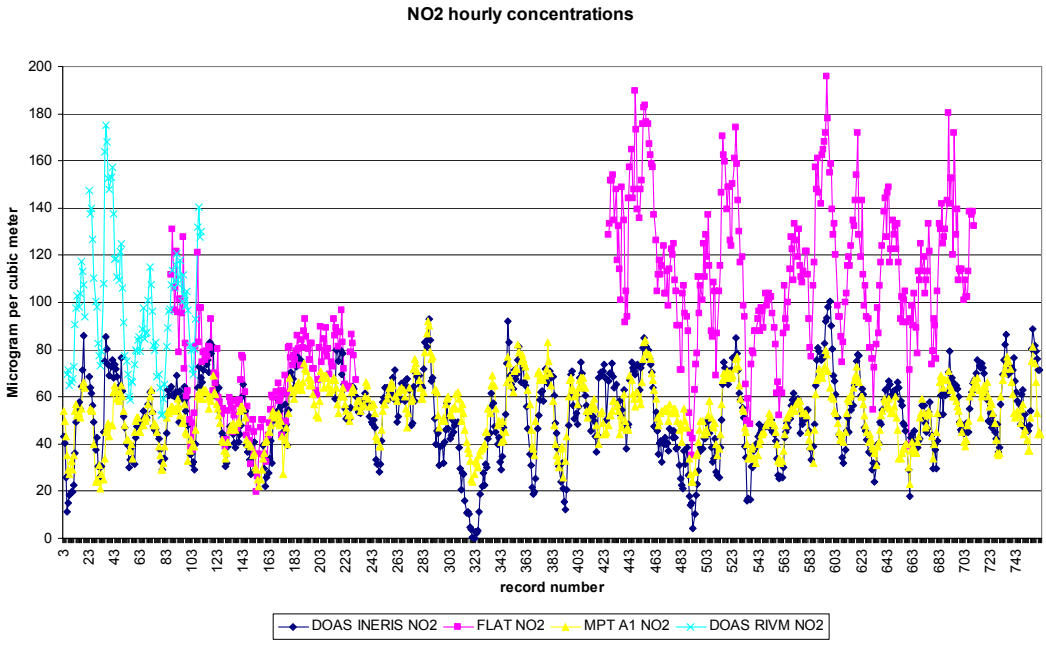

Figure 2: NO_2 concentrations over the whole of the period

Discussion of results

The concentration variations measured by the DOAS system used by INERIS displayed a striking similarity to that of the measuring station A1, but the concentrations were much lower than those obtained from the DOAS system used by RIVM. The cause of this difference is still under investigation. The monitor in the apartment was out of order for a couple of days and once working again, the concentrations appeared to be much higher than from the other equipment. The reason for significantly different concentration levels for the FLAT-NO_2 (1st and 2nd period) is probably due to the NO_x-analyser, but DCMR has been unable to establish whether this was attributable to the calibration procedure, the sampling procedure, the NO_x converter or some other factor..

The DOAS system used by INERIS also appears to be a useable system following the NO_2 concentration variations measured above the highway. Statistical analysis of the hourly values from this system and the standard NO_x monitors indicated poor correlation (r^2=0.40), but the DOAS system does follow the same pattern as the monitors.

The correlation is calculated over the whole measurement period. If the periods are examined individually, the correlation for the first period is 0.52 and for the second period 0.80.

Overall conclusion

In conclusion it can be stated that although the DOAS systems and the standard NO_x monitors do not yield the same results, even when they are operated adjacent to each other, the DOAS system may very well be used to follow the pattern of NO_2 concentrations above a highway. Comparison of path-oriented measurements with traditional NO_2 measurements will be difficult, however.

Rotterdam would like to state that in HEAVEN an exhaustive investigation can not be carried out and the results provide an indication on the applicability of the DOAS technique only.

Indicator 2: Accuracy of roadside description, air models

Measurements were performed on three roadtypes :

Roadtype x	Open field location next to the motorway A13 between Den Haag and Rotterdam
Roadtype y	City location next to the motorway A13 in city district Overschie
Roadtype z	City corridor in city district Charlois: the Vaanweg – Pleinweg corridor

For each road type the following tables were completed

Location X: Open field A13

Which organization(s) did the testing?	TNO/DCMR collected the measurements, TNO completed the modelling and the comparison of the modelled and measured values
When did the testing take place?	Testing took 6 months: from June till December 2001
Which pollutants have been measured and calculated?	Measured: NO, NO_2, CO, Benzene, PM_{10}, O_3 Calculated: NO_2, Benzene and PM_{10}

$$\Delta C = \frac{\sum \frac{(C_m - C_{calc})}{C_{calc}}}{n} \qquad \Delta C_{abs} = \frac{\sum \frac{|C_m - C_{calc}|}{C_{calc}}}{n}$$

Open field		ΔC	ΔC_{abs}	Max. ΔC	OK / NOT OK
NO_2 , A1	October	0.08	0.27	0.6	OK
	November	0.11	0.19	0.6	OK
	December	0.21	0.27	0.6	OK
NO_2 , A2	October	-0.04	0.20	0.6	OK
	November	0.23	0.25	0.6	OK
	December	0.69	0.72	0.6	NOT OK
PM_{10}, A1	October	0.02	0.10	0.5	OK
	November	0.02	0.09	0.5	OK
	December	0.07	0.19	0.5	OK
PM_{10}, A2	October	0.01	0.08	0.5	OK
	November	0.05	0.11	0.5	OK
	December	0.07	0.10	0.5	OK
Benzene, A1	October	0.35	0.55	0.5	OK
	November	0.001	0.15	0.5	OK
	December	0.02	0.13	0.5	OK
Benzene, A2	October	0.44	0.55	0.5	OK
	November	0.24	0.33	0.5	OK
	December	0.03	0.11	0.5	OK

Location Y: City location A13 Overschie

Which organization(s) did the testing?	TNO/DCMR collected the measurements, TNO completed the modelling and the comparison of the modelled and measured values
When did the testing take place?	Testing took 8 months: from April till December 2001
Which pollutants have been measured and calculated?	Measured: NO_2, CO, Benzene, PM_{10}, O_3 Calculated: NO_2, Benzene and PM_{10}

Overschie		**ΔC**	**ΔC_{abs}**	**Max. ΔC**	**OK / NOT OK**
NO_2 , E1	July	-0.09	0.16	0.6	OK
	August	0.08	0.34	0.6	OK
	September	0.14	0.35	0.6	OK
NO_2 , E2	July	0.06	0.18	0.6	OK
	August	0.46	0.49	0.6	OK
	September	0.32	0.32	0.6	OK
PM_{10}, E1	July	0.07	0.16	0.5	OK
	August	0.07	0.16	0.5	OK
	September	0.05	0.13	0.5	OK
PM_{10}, E2	July	0.09	0.20	0.5	OK
	August	0.03	0.15	0.5	OK
	September	0.04	0.11	0.5	OK
Benzene, E1	July	0.21	0.45	0.5	OK
	August	0.16	0.29	0.5	OK
	September	0.33	0.40	0.5	OK
Benzene, E2	July	1.48	1.52	0.5	NOT OK
	August	0.20	0.35	0.5	OK
	September	0.23	0.30	0.5	OK

Location Z: City corridor Vaanweg - Pleinweg

Which organization(s) did the testing?	TNO/DCMR collected the measurements, TNO completed the modelling and the comparison of the modelled and measured values
When did the testing take place?	Testing took 7 months: from May till December 2001
Which pollutants have been measured and calculated?	Measured: NO_2, CO, Benzene, PM_{10} Calculated: NO_2, Benzene and PM_{10}

Pleinweg		**ΔC I/II**	**ΔC_{abs} I/II**	**Max. ΔC**	**OK / NOT OK**
NO_2 , E4	July	0.00/-0.24	0.26/0.33	0.6	OK

	August	0.38/-0.12	0.52/0.31	0.6	OK
	September	0.23/0.00	0.26/0.23	0.6	OK
	October	- /0.41	-/0.52	0.6	OK
PM_{10}, E4	July	-0.10/-0.34	0.30/0.35	0.5	OK
	August	no data	no data	0.5	OK
	September	0.23/0.00	0.26/0.33	0.5	OK
	October	-/0.27	-/0.28	0.5	OK
Benzene, E4	July	-0.05/-0.15	0.43/0.70	0.5	OK
	August	-0.03/-0.32	0.31/0.44	0.5	OK
	September	0.13/-0.11	0.58/0.52	0.5	OK
	October	-/-0.22	-/0.41	0.5	OK

Indicator 3: Accuracy of roadside description, Noise models

This indicator is not applicable for Rotterdam.

Indicator 4: Testing processes of DSS interfaces

Indicator 4a: Test Interface to Traffic Monitoring Process

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	March 2002	3 hours		OK
Operational time	March 2002	99% of total time	> 95%	OK
Correct data in and out, referred to data in monitoring station	Several checks	YES	Data in DSS equals data in monitoring station	OK
Speed	Several checks	Between 1-2 minutes for proces P3	Hourly update	OK

To which process(es) does the above table refer?	P3 Real time traffic information
What method(s) were used for testing?	Examining logfiles, ascii-editor, dbase viewer
Which organization(s) did the testing?	Goudappel / AGV
When did the testing take place?	27th March 2002
Any other remarks concerning this sub-indicator?	Due to different kinds of failures throughout the whole of the local DSS it has not yet been possible to acgieve a continuous period of 3 weeks operational time for this process. In March the process itself had 3 failures and could not operate for 108 hours due to failures in other

	parts of the DSS. The speed may drop marginally when the online data from the Rotterdam ring road is available. For the moment, it is tested with comparable data from a CD-ROM, which presents the average data for the same hour during the same day in the same period last year. On the basis of calculations, it is predicted that the connection speed will still be high enough for the hourly updates. This will be reported in the Final Verification Plan.It is expected that the system will be operational for 3 weeks before the end of June. The final verification results will be reported in the Final Verification Report.

Indicator 4b: Test Interface to Meteorological Monitoring Process

CRITERION	Testperiod / frequency	Value	Success Criterion	OK / NOT OK or N/A
Number of system failures	1 month	58 hours		OK
Operational time	1 month	93% of total time	> 95%	OK
Correct data in and out, referred to data in monitoring station	Several checks	YES	Data in DSS equals data in monitoring station	OK
Speed	Several checks	few seconds	Hourly update	OK

To which process(es) does the above table refer?	P4 Realtime meteorological data from KNMI
What method(s) were used for testing?	Examining logfiles, checks for correct data transfer
Which organization(s) did the testing?	City of Rotterdam, Goudappel Coffeng, DCMR
When did the testing take place?	December 2001 – January 2002
Any other remarks concerning this sub-indicator?	Process works but not 95% of the time or more, mostly due to network problems at DCMR

Indicator 4c: Test Interface to Environmental Monitoring Network Process

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	1 month	181 hours		NOT OK
Operational time	1 month	77% of total time	> 95%	NOT OK
Correct data in and out, referred to data in monitoring station	Several checks		Data in DSS equals data in monitoring station	OK
Speed	Several checks	few seconds	Hourly update	OK

To which process(es) does the above table refer?	P5 Realtime background concentrations from DCMR

What method(s) were used for testing?	Examining logfiles, checks for correct data transfer
Which organization(s) did the testing?	City of Rotterdam, Goudappel Coffeng, DCMR
When did the testing take place?	December 2001 – January 2002
Any other remarks concerning this sub-indicator?	There was a connection problem from 29th December-2nd January. When these (115) hours are left out of the calculations, an operational time of about 90% is reached (with 66 hours of failure)

Indicator 4d: Test Interface to Static & Infrequently Updated Information Process

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	several times	0		OK
Operational time	several times	100% of total time	> 95%	OK
Correct data in and out, referred to data in source	several times	YES	Data in DSS equals data in source	OK
Speed	N/A	N/A	Hourly update	N/A

To which process(es) does the above table refer?	P1 Import static and infrequently updated data
What method(s) were used for testing?	Running the import program, changing values and export them to database, check in database if altered
Which organization(s) did the testing?	City of Rotterdam, Goudappel Coffeng, DCMR
When did the testing take place?	December 2001 – January 2002
Any other remarks concerning this sub-indicator?	

Indicator 4e: Test Interface to Information Flow Process

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures				
Operational time		% of total time	> 95%	
Correct data in and out, referred to data in DSS database	Several checks		Data information presentation equals data in DSS	OK
Speed			Hourly update	

To which process(es) does the above table refer?	P201 Data flow from database to user interface P301 Data flow from database to website
What method(s) were used for testing?	Examining logfiles, compare data in user interface and at the website with data in database
Which organization(s) did the testing?	Goudappel / AGV
When did the testing take place?	27th March 2002
Any other remarks concerning this sub-indicator?	The system was not operational for the necessary period of time for the verification. Results are expected in time for the Final Verification Report. The colours on the interface could not easily be distinguished, a more significant difference between the colours was useful. As a result, these changes to the colours have been made.

Indicator 5: Testing DSS modelling and forecasting processes

Indicator 5a: Test Air Quality Emission Process

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	March 2002	None		OK
Operational time	March 2002	100%	> 95%	OK
Speed	Several checks	Hourly	Hourly update	OK

To which process(es) does the above table refer?	P111 Vehicle Emission Model
What method(s) were used for testing?	Examining logfiles
Which organization(s) did the testing?	Goudappel / AGV
When did the testing take place?	27th March 2002
Any other remarks concerning this sub-indicator?	Due to different kinds of failures throughout the whole of the local DSS it has not yet been possible to achieve a continuous period of 3 weeks operational time for this proces. In March, the process itself had no failures but could not operate for 110 hours due to failures in other parts of the DSS. It is expected that the system will be operational for a continuous period of 3 weeks before the end of June. The final verification results will be put in the Final Verification Report.

Indicator 5b: Test Air Quality Concentration Process

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	March 2002	None		OK
Operational time	March 2002	100%	> 95%	OK
Speed	Several checks	Few seconds	Hourly update	OK

To which process(es) does the above table refer?	P120 Concentration model (in fact 2 processes, 1 for the corridor and 1 for the ringroad)
What method(s) were used for testing?	Examining logfiles
Which organization(s) did the testing?	Goudappel / AGV
When did the testing take place?	27th March 2002
Any other remarks concerning this sub-indicator?	Due to different kinds of failures throughout the whole of the local DSS it has not yet been possible to a continuous period of 3 weeks operational time for these two processes P120. In March, the processes themselves had no failures but could not operate for 131 hours due to failures in other parts of the DSS. It is expected that the system will be operational for a continuous period of 3 weeks before the end of June. The final verification results will be put in the Final Verification Report.

Indicator 5c: Test Noise Modelling Process

This indicator is not applicable to Rotterdam.

Indicator 5d: Test Traffic Modelling and Forecast Process

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures				
Operational time		% of total time	> 95%	
Speed			Hourly update	

To which process(es) does the above table refer?	
What method(s) were used for testing?	
Which organization(s) did the testing?	
When did the testing take place?	
Any other remarks concerning this sub-indicator?	It is expected that the system will be operational for a continuous period of 3 weeks before the end of June. The final verification results will be put in the Final Verification Report.

Indicator 5e: Test Result Processing Process

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	March 2002	None		OK
Operational time	March 2002	100%	> 95%	OK
Speed	Several checks	few seconds	Hourly update	OK

To which process(es) does the above table refer?	P121a, Result Collection, emission P121c, Result Collection, concentration ringroad
What method(s) were used for testing?	Examining logfiles, ascii-editor, dbase viewer
Which organization(s) did the testing?	Goudappel / AGV
When did the testing take place?	27th March 2002
Any other remarks concerning this sub-indicator?	Due to different kinds of failures throughout the whole of the local DSS it has not yet been possible to achieve a continuous period of 3 weeks operational time for these processes. In March, both processes had no failures and could not operate for 110 (P121a) and 187 (P121c) hours due to failures in other parts of the DSS. It is expected that the system will be operational for a continuous period of 3 weeks before the end of June. The final verification results will be put in the Final Verification Report.

Indicator 5e: Test Result Processing Process

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	March 2002	23 hours		OK
Operational time	March 2002	95%	> 95%	OK
Speed	Several checks	few seconds	Hourly update	OK

To which process(es) does the above table refer?	P121b, Result Collection, concentration corridor
What method(s) were used for testing?	Examining logfiles, ascii-editor, dbase viewer
Which organization(s) did the testing?	Goudappel / AGV
When did the testing take place?	27th March 2002
Any other remarks concerning this sub-indicator?	Due to different kinds of failures throughout the whole of the local DSS it has not yet been possible to achieve a continuous period of 3 weeks operational time for this process. In March, the process had 23 hours of failure and could not operate for 131 hours due to failures in other parts of the DSS. It is expected that the system will be operational for a continuous period of 3 weeks before the end of June. The final verification results will be put in the Final Verification Report.

Indicator 6: Testing DSS operator interface and scenario processes

Indicator 6a: Test DSS Operator Interface Presentation Process

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	3 weeks			
Operational time	3 weeks	N/A	> 95%	N/A
Correct data in and out, referred to data in monitoring station	Several times		Data information presentation equals data in DSS	
Speed	3 weeks	< 1 Hour	Hourly update	

To which process(es) does the above table refer?	N/A
What method(s) were used for testing?	"Playing" with the database and software, checking if all the presented information is understandable, checking if all the presented information equals the data in the database
Which organization(s) did the testing?	DCMR, Goudappel
When did the testing take place?	
Any other remarks concerning this sub-indicator?	It is expected that the system will be operational for a continuous period of 3 weeks before the end of June. The final verification results will be put in the Final Verification Report.

Indicator 6b: Test DSS Operator Interface Intervention Process

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	3 weeks			
Operational time	3 weeks	N/A	> 95%	N/A
Correct data in and out, referred to data in monitoring station	Several times		Data information presentation equals data in DSS	
Speed	3 weeks	< 1 Hour	Hourly update	

To which process(es) does the above table refer?	N/A
What method(s) were used for testing?	Checking if the operator can intervene in case of small disturbances, checking if the operator understands the technical part of the DSS
Which organization(s) did the testing?	DCMR, Goudappel
When did the testing take place?	
Any other remarks concerning this sub-indicator?	It is expected that the system will be operational for a continuous period of 3 weeks before the end of June. The

	final results will be put in the Final Verification Report.

Indicator 6c: Test DSS Scenario Process

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures				
Operational time		% of total time	> 95%	
Correct data in and out, referred to data in monitoring station			Data stored in DSS equals scenario data	

To which process(es) does the above table refer?	
What method(s) were used for testing?	
Which organization(s) did the testing?	
When did the testing take place?	
Any other remarks concerning this sub-indicator?	It is expected that the system will be operational for a continuous period of 3 weeks before the end of June. The final verification results will be put in the Final Verification Report.

Indicator 7: Testing the functioning of the main system components and their interaction

CRITERION	Testperiod / frequency	Value	Success criterion	OK / NOT OK or N/A
Number of system failures	3 weeks	Number of system failures		
Operational time	3 weeks	% of total time	> 90%	
Speed	Several checks		Hourly update	

To which process(es) does the above table refer?	
What method(s) were used for testing?	Examining logfiles, ascii-editor, dbase viewer
Which organization(s) did the testing?	Goudappel
When did the testing take place?	
Any other remarks concerning this sub-indicator?	Due to different kinds of failures throughout the whole system of the local DSS it has not yet been possible to achieve a continuous period of 3 weeks operational time. In March, the P0 could not operate for 105 hours due to failures in parts of the DSS. Over a period of 610 hours, 505 100% operational hours (exactly 3 weeks) where found. It is expected that the system will be operational for a

	continuous period of 3 weeks before the end of June. The final verification results will be reported in the Final Verification Report.

Indicator 8: User acceptance by professional users

Indicator 8a: Does the DSS meet the system requirements as described in WP5?

It is expected that the system will be operational for a continuous period of 3 weeks before the end of June. The final verification results will be reported in the D8.8.

Questions about Functional Requirements "To which extent are the following requirements implemented satisfactory?" Rating 1-5 (1=not at all satisfactory 5=very satisfactory) **When the rating is below 4, please ask for an explanation**	**Score user 1**	**Score user 2**	**Score user 3**	**Score user 4**	**Score user 5**
Traffic information management					
Does the system support on-line network traffic monitoring through interface with the traffic control and monitoring systems					
Does the system support accurate and efficient incident detection?					
Does the system support recording of traffic data and formation of historical series and statistics					
Does the system support traffic forecasting?					
Does the system support traffic demand modelling?	-	-	-	-	-
Does the system support the optimisation of traffic control?	-	-	-	-	-
Does the system support the evaluation of short-term and long-term traffic measures?					
Does the system support near real-time traffic status representation for the whole demonstration area					
Air quality modelling					
Does the system support emissions modelling based on near real-time traffic measurements?					
Does the system support emissions modelling based on modelled traffic data?					
Does the system support pollutants dispersion modelling at the street and area levels?					
Does the system support recording of monitored pollutant levels and modelled data?					
Does the system support background pollution modelling?	-	-	-	-	-
Does the system support noise modelling at the *hotspots?*	-	-	-	-	-
Does the system support air quality modelling based on current traffic levels and on predefined traffic and demand management scenarios?					
The system shall support evaluation of the environmental effect of short and long term transport policies					

EXPLANATION IN CASE OF SCORES LOWER THAN 4

Indicator 8b: Is the information provided by the system easy to understand?

It is expected that the system will be operational for a continuous period of 3 weeks before the end of June. The final verification results will be reported in D8.8.

Questions about understandable information Rating 1-5 (1=not at all satisfactory 5=very satisfactory) **When the rating is below 4, please ask for an explanation**	**Score user 1**	**Score user 2**	**Score user 3**	**Score user 4**	**Score user 5**
Information presentation					
Does the system support data representation via maps, charts and generic tables					
Environmental maps					
How do you rate the comprehensibility of the HEAVEN information presentation via *maps*					
How easy to use is the HEAVEN information presentation via *maps*					
How useful is the HEAVEN information presentation via *maps* to manage urban mobility					
How do you rate the comprehensibility of the colour codes used on the *maps*					
Is the level of geographical detail presented in maps satisfactory					
Environmental charts and generic tables					
How do you rate the comprehensibility of the HEAVEN information presentation *via charts and generic tables*					
How easy to use is the HEAVEN information presentation *via charts and generic tables*					
How useful is the HEAVEN information presentation *via charts and generic tables to manage urban mobility*					
Traffic maps					
How do you rate the comprehensibility of the HEAVEN information presentation via *maps*	-	-	-	-	-
How easy to use is the HEAVEN information presentation via *maps*	-	-	-	-	-
How useful is the HEAVEN information presentation via *maps* to manage urban mobility	-	-	-	-	-
How do you rate the comprehensibility of the colour codes used on the *maps*	-	-	-	-	-
Is the level of geographical detail presented in maps satisfactory	-	-	-	-	-
Traffic charts and generic tables					
How do you rate the comprehensibility of the HEAVEN information presentation *via charts and generic tables*	-	-	-	-	-
How easy to use is the HEAVEN information presentation *via charts and generic tables*	-	-	-	-	-
How usefull is the HEAVEN information presentation *via charts and generic tables to manage urban mobility*	-	-	-	-	-
Health information					
How do you rate the comprehensibility of health information presented					
How easy to use is the health information presented					
Information output					
Does the system deliver reports dealing with model outputs and evaluation of traffic demand management strategies					

Questions about understandable information Rating 1-5 (1=not at all satisfactory 5=very satisfactory) **When the rating is below 4, please ask for an explanation**	**Score user 1**	**Score user 2**	**Score user 3**	**Score user 4**	**Score user 5**
Does the system support attention and alarm pollutant levels achievement detection and forecast					
Is information presentation driven through a suitable MMI					
Are you satisfied with the update interval of the information					
Operator interface					
Does the system interface support operator driven scenario definition					
Is the system interface for support of operator driven definitions comprehensible?					
Is the system interface for support of operator driven definitions easy to use?					
Is the system interface for support of operator driven definitions useful to manage urban mobility?					
Does the system interface drive the operator through the tasks related to off-line evaluation of the impact of scenarios on the environment					
Are these procedures comprehensible					
Are these procedures easy to use					

EXPLANATION IN CASE OF SCORES LOWER THAN 4

Indicator 9: User acceptance by the general public

User 1: Mr. Van Beek, inhabitant Charlois
User 2: Mr. Wilschut, inhabitant Overschie
User 3: Mr. Eggink, inhabitant Charlois
User 4: Ms Van der Horst, inhabitant Overschie
User 5: Ms. Aarts, representative of environmental organisation

Questions on understandable information Rating 1-5 (1=not at all satisfactory 5=very satisfactory) **When the rating is below 4, please ask for an explanation**	**Score user 1**	**Score user 2**	**Score user 3**	**Score user 4**	**Score user 5**
Information presentation	4	3b	3g	4	3n
Environmental maps					
How readable is HEAVEN information via *maps*	4	4c	4c/h	2l	4c
How do you rate the comprehensibility of the HEAVEN information presentation via *maps*	4	5	4	2c	4
How easy to use is the HEAVEN information presentation via *maps*	4	4	2i	3m	4
How useful is the HEAVEN information presentation via *maps*	4	3d	3j	n/a	2o
How do you rate the comprehensibility of the colour codes used on the *maps*	5	5	2k/d	5	4
Is the level of geographical detail presented in maps satisfactory	4	5	5	4	5
Environmental charts and generic tables					
How readable is HEAVEN information via *via charts and generic tables*	a	a	a	a	a
How do you rate the comprehensibility of the HEAVEN information presentation *via charts and generic tables*	a	a	a	a	a
How easy to use is the HEAVEN information presentation *via charts and generic tables*	a	a	a	a	a
Traffic maps					
How do you rate the comprehensibility of the HEAVEN information presentation via *maps*	-	-	-	-	-
How easy to use is the HEAVEN information presentation via *maps*	-	-	-	-	-
How do you rate the comprehensibility of the colour codes used on the *maps*	-	-	-	-	-
Is the level of geographical detail presented in maps satisfactory	-	-	-	-	-
Traffic charts and generic tables					
How do you rate the comprehensibility of the HEAVEN information presentation *via charts and generic tables*	-	-	-	-	-
How easy to use is the HEAVEN information presentation *via charts and generic tables*	-	-	-	-	-
Health information					
How do you rate the comprehensibility of health information presented	4	3e	4	4	4
How easy to use is the health information presented	4	4f	5	5	4

EXPLANATION IN CASE OF SCORES LOWER THAN 4
a. In Rotterdam it was decided that **Environmental charts and generic tables** would not be presented on the website, but the information would be presented via different maps. The public users indicated that there was a need for a limited amount of (bar-) charts. They felt that a (bar-)chart would make it possible to compare the present day with historic data, for example the weekly trend and annual trend. This would be of added value to the users. They felt that the maps were insufficient for theis kind of comparison. Inhabitants could get to know when/which week the situation was really bad.

Information presentation
b. Nice website, a bit global, put together more like a gadget. Link to traffic information/websites and meteorological data is requested. When zooming to a level, then changing to another pollutant, the zoom level should stay the same, and not always start with the highest level.
g. Letters somewhat bigger.
n. Goal of website unclear to this user. Would like to include the meaning of the different pollutants, and connect directly to the health advice.

Readable
c. The legend should be presented next to the map
h. Next to map, there should be a link to the health information

Easy to use
i. Zooming only possible with real time situation, but arrows remain on screen with other options too.
The time period of the video is unclear.
m. Would like to zoom on "worst case" option.

Useful
d. More possibilities for comparison of different situations, the trends, and locations is needed. Prognosis for the day ahead would be even better if it was presented in blocks of hours for that specific day (to make it possible to decide to shift a necessary action to another part of the day)
j. Useful for inhabitants and risk groups in determining hotspots and communicating with the public authorities.
o. To follow the health advice would be difficult. Difficult to know what to do with the information.

Comprehensibility
k. The 24-hour average is not clear. This is an expert term which needs explanation.
Video is running too fast, one image should be showed every 4 or 5 seconds.
Add message that for prognoses the meteo of the day before is used??? I can't understand what is meant here.

Health information
e. Very comprehensible but it is very global information
f. One should not expect detailed information, because the information is global. It is possible to act on a situation dependent on each individual's medical condition.

Extra wishes:
-Additional information in charts for selected hotspots (trends of last 24-hours and last week for specific hotspot)
-Link to DCMR site with measure equipment tables???? would be nice
l. Numbers of roads or names of boroughs, airport and central station to be included in the map as geographical focus points. Colour the river blue.

In conclusion, all users were very happy with the HEAVEN initiative!