

**Progress Report of the  
VIAQ (Vehicle Interior Air Quality)  
Informal Working Group**

**10th November 2017**

Chair: Andrey Kozlov, Russia

Vice-chair : Jongsoon LIM, Korea

Technical secretary: Andreas Wehrmeier, OICA

## ● VIAQ Background, ToR and Mandate

- **WP.29 Mandate**(ECE/TRANS/WP.29/1112, para 133)
  - AC.3 endorsed the proposed action plan to, in a first stage, collect information, review existing standards and develop recommendations.
  - End of mandate : November 2017
- **GRPE Adoption**(ECE/TRANS/WP.29/GRPE/70)
  - GRPE adopted the proposals for terms of reference to the IWG on VIAQ as reproduced in Annex VI of this report.
- **Review of VIAQ Terms of Reference**
  - The scope of the work is to develop a recommendation (R.E.3, S.R.1, or a new Mutual Resolution) to harmonize test procedures of interior air emissions emitted/generated from interior materials.

- **VIAQ IWG Meetings since the last GRPE sessions**

- **9<sup>th</sup> VIAQ IWG Meeting**

- Tele-conference Meeting, June 1<sup>st</sup>

- **10<sup>th</sup> VIAQ IWG Meeting**

- Geneva, Switzerland, November 10<sup>th</sup>

## ● Working document in GRPE

### ➤ **ECE/TRANS/WP.29/GRPE/10**

- Proposal for a new Mutual Resolution (M.R.3) of the 1958 and the 1998 Agreements concerning Vehicle Interior Air Quality (VIAQ)

### ➤ **GPPE-75-02(Amendments), GRPE-75-03 (consolidated version)**

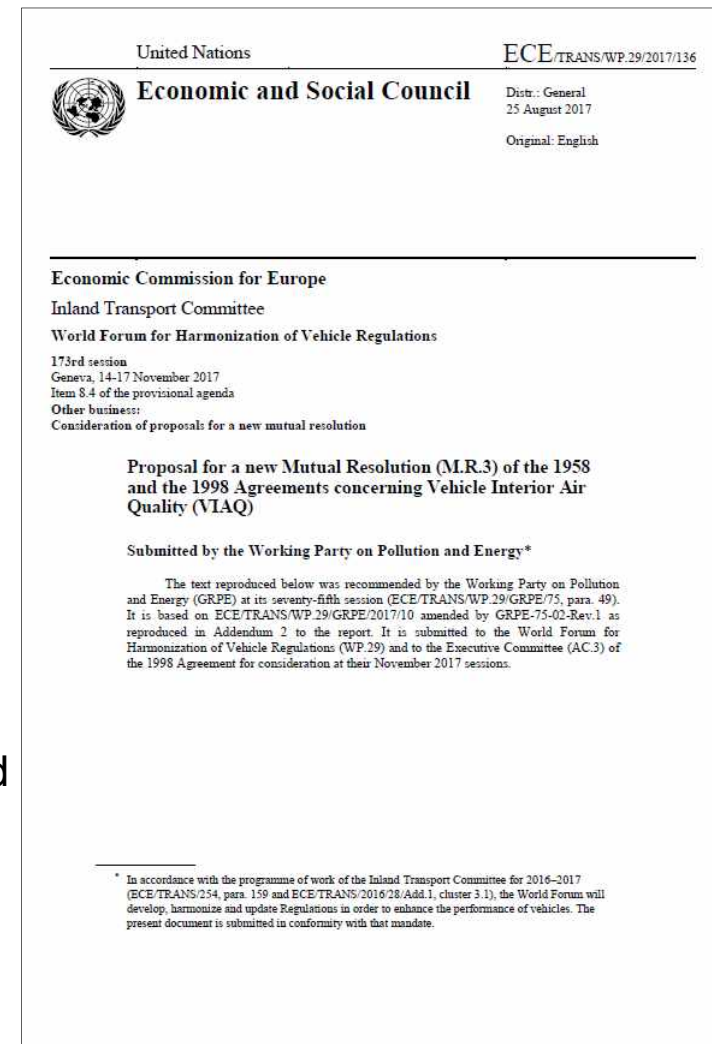
- Proposal for amendments to ECE/TRANS/WP.29/GRPE/2017/10 on a new Mutual Resolution on VIAQ

### ➤ **Justification**

- Most paragraphs are editorial corrections to improve the wording clarification
- Adds “carbonyl compounds” and “VOCs” to further define and classify test substances
- Considers the current level of background concentration
- Gives flexibilities with no affects to the tests for opening the door time to “30-60 minutes”
- Gives specific set temperature for HVAC setting in driving mode and changes to “23 ° C

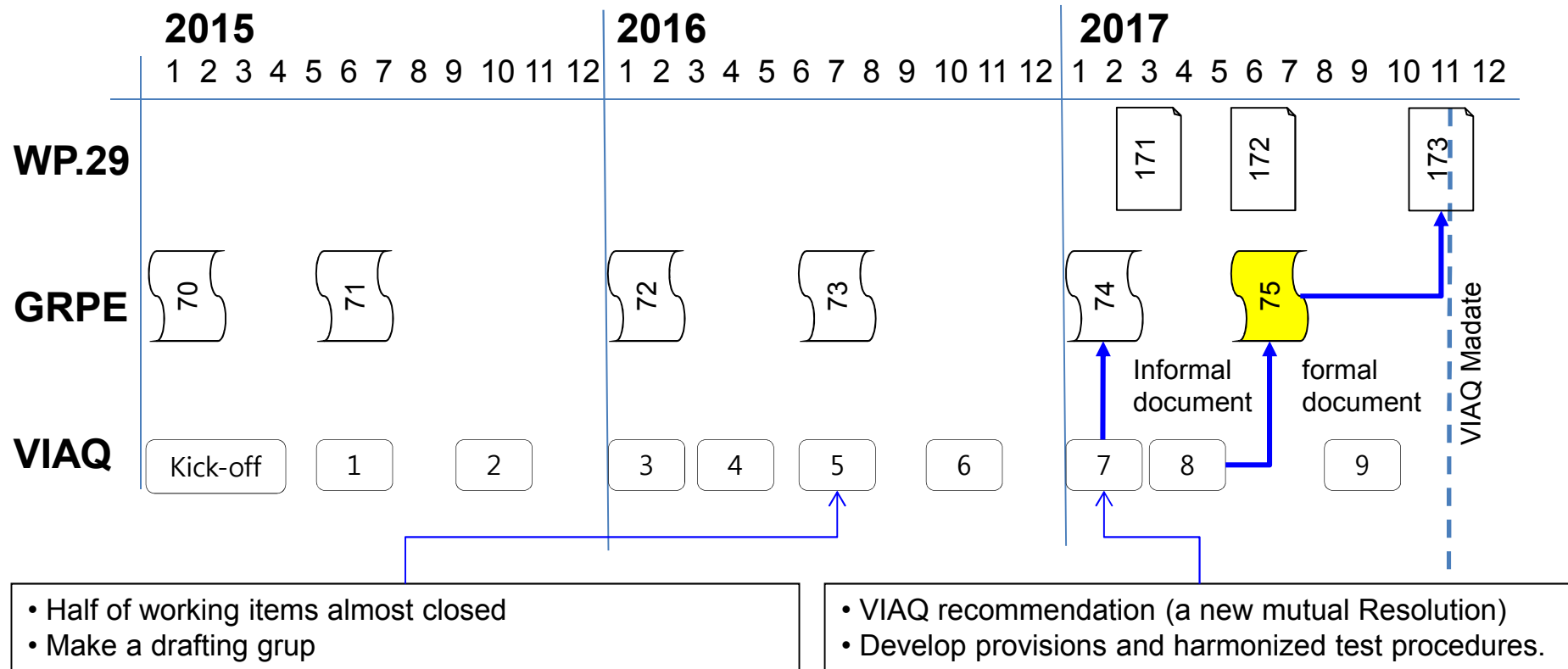
## ● Working document in WP.29

- **ECE/TRANS/WP.29/2017/136**
- Proposal for a new Mutual Resolution (M.R.3) of the 1958 and the 1998 Agreements concerning Vehicle Interior Air Quality (VIAQ)
- Agenda 8.4 Consideration of proposals for a new mutual resolution at the 173<sup>rd</sup> session of the World Forum.
- ECE/TRANS/WP.29/GPRE/75, para49, based on ECE/TRANS/WP.29/GRPE/2017/10 amended by GRPE-75-02-rev.1 as reproduced in Addendum2



# Roadmap, Timeline

## ● Roadmap



- **January 2017** : Submit the VIAQ document as an informal document
- **June 2017** : Submit the amendment of VIAQ document, if necessary

## ● VIAQ Background, ToR and Mandate for Second stage

- **GRPE** (ECE/TRANS/WP.29/GRPE/75, para 47)
  - At the 75th GRPE session, the Chair of the IWG on Vehicles Interior Air Quality requested an extension of the mandate of the IWG on VIAQ until November 2020 to expand the work to consider not only emissions generated by interior materials but also gases from other sources that enter into the vehicle cabin. He introduced a first draft of the updated terms of reference and rules of procedure (GRPE-75-14) for this second stage of the work and expressed the group's intention to submit a final version at the next GRPE session in January 2018. For this second stage of the work, he noted that the Russian Federation would chair the IWG, together with Korea as Vice-Chair and OICA for the Secretary. He explained that the endorsement by GRPE at this session of the extension of the mandate of the IWG on VIAQ would allow the group to continue working without any interruption between the end of the current mandate and the next GRPE session in January 2018. He invited all Contracting Parties to be involved in the new stage of work.

## ● VIAQ Background, ToR and Mandate for Second stage

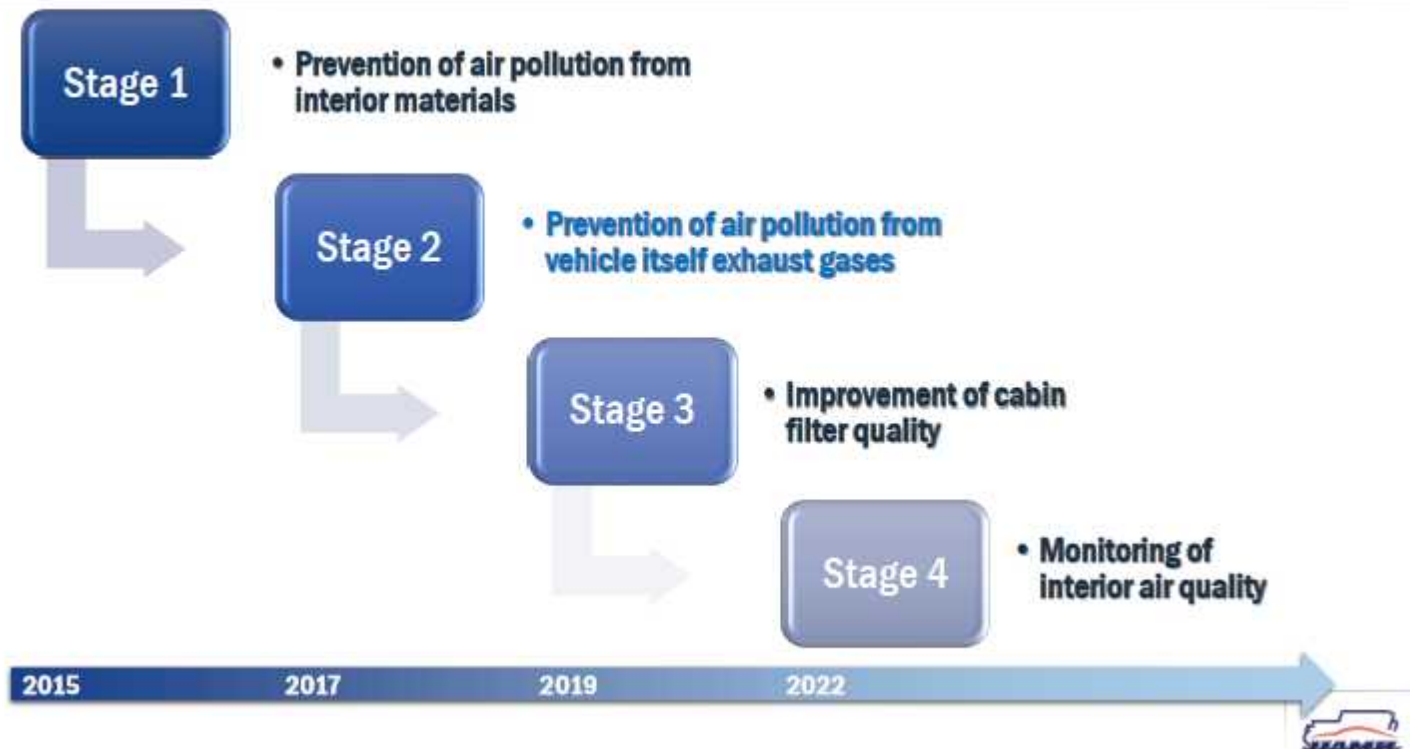
- **WP.29** (ECE/TRANS/WP.29/WP.29/1131, para 44)
  - At the 172nd WP.29 session, WP.29 endorsed the extension of the mandate of the IWG on VIAQ until November 2020 to extend the work to consider not only emissions generated by interior materials, but also gases from other sources that enter into the vehicle cabin. WP.29 noted that a first draft of the updated terms of reference and rules of procedure was submitted by the IWG on VIAQ at the June 2017 GRPE session (GRPE-75-14) and that a final version is expected to be considered by GRPE at its January 2018 session.



- **Second stage of VIAQ IWG Mandate**

- **Discussion on the second stage(VIAQ-07-11)**

The roadmap for improving vehicle interior air quality

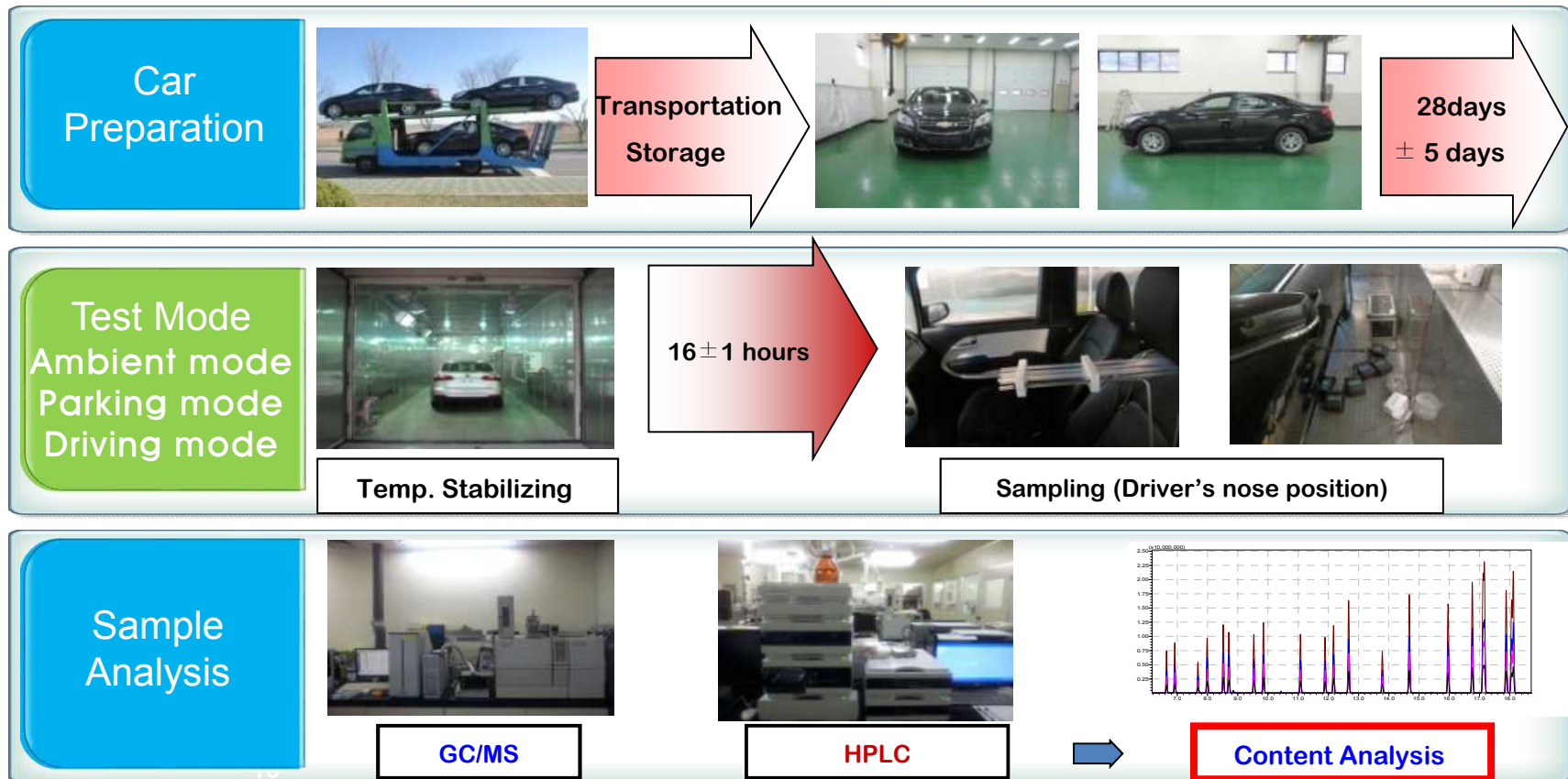


# The Second Stage Mandate

VIAQ IWG  
Vehicle Interior Air Quality  
Informal Working Group

## ● Roadmap of VIAQ IWG Activities

### ➤ Stage 1 - Measurement for interior material emissions

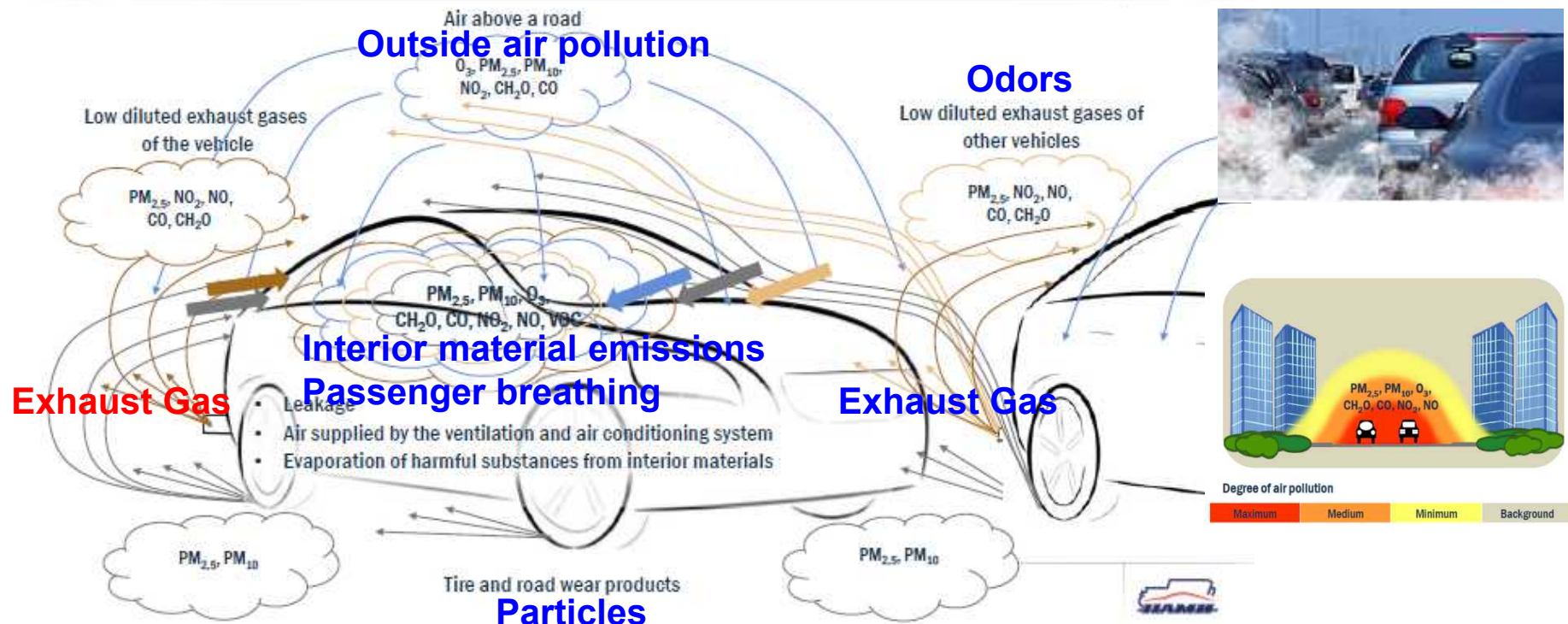


GC/MS: Gas Chromatography Mass Spectrometry  
HPLC : High Performance Liquid Chromatography 10p

## ● Roadmap of VIAQ IWG Activities

- **Stage 2** - Develop the test procedure for vehicle exhaust gases entering the vehicle cabin (VIAQ-07-11)

Main sources of air pollution in an interior of modern cars

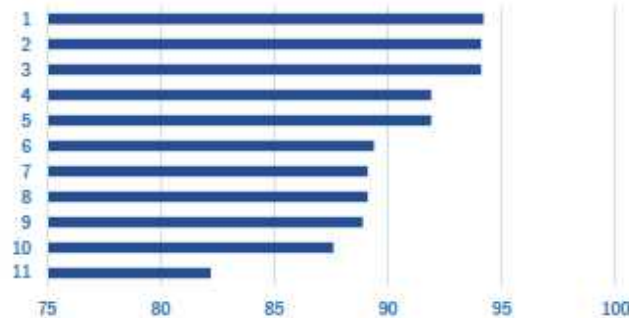


## ● Roadmap of VIAQ IWG Activities

- **Stage 3** - Assessment of cabin filter quality (VIAQ-07-11)
  - Particle filter, Active carbon filter, Combined filter, HEPA filter

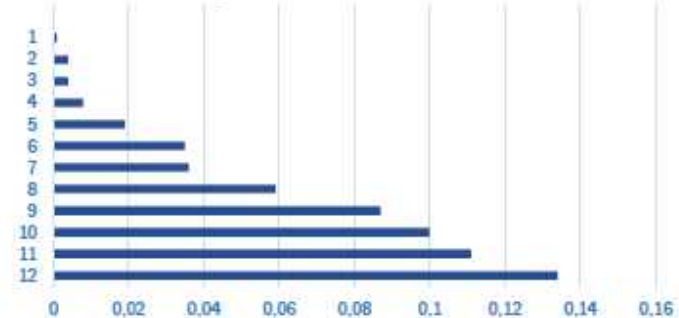
### Effectiveness of cabin filters

**Dust filters**  
Results from NAMI (V.Volkov)  
Effectiveness of particulates filtering, %



● Dust, pollen and dirt particles  
● Particulates, diesel soot and bacteria  
1 Preliminary filter  
2 Carrier fleece  
3 Microfiber fleece

**Carbon filters**  
Results from NAMI Testing Centre (Z.Bulicheva)  
NO<sub>2</sub> concentration in cabin, mg/m<sup>3</sup>



● Dust, pollen and dirt particles  
● Particulates, diesel soot and bacteria  
● Harmful and odorous gases  
1 Preliminary filter  
2 Carrier fleece  
3 Microfiber fleece  
4 Activated carbon

Pictures from Bosch





## ● Roadmap of VIAQ IWG Activities

- **Stage 4** - Monitoring of interior air quality (VIAQ-07-11)
  - AQS (Air Quality Sensors), PM sensor, Ionizer, CO2 management in cabin,

### Interior air quality monitoring

**Sensors**



**Fuel vapors**

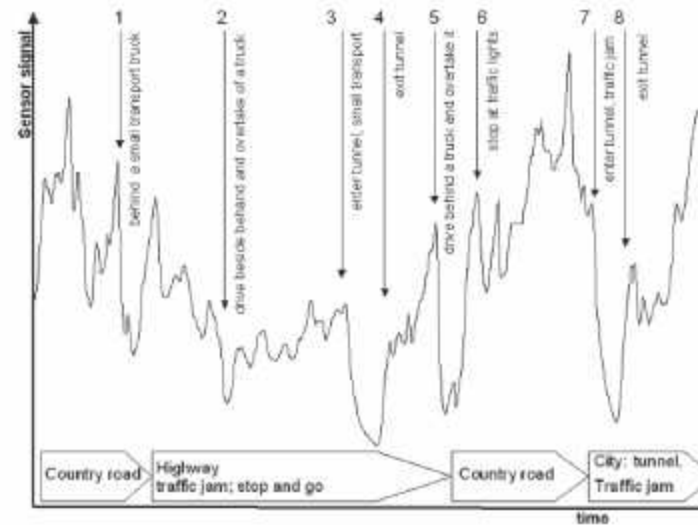


**Carbon oxide**

**Comparison of three gas-sensing technologies with respect to vehicle air quality monitoring criteria**

Criteria	Infra Red-Optical	Electrochemical	Metal Oxide
Cost	\$15US	\$10US	\$10US
Life time	>6 years	2-5 years	>6 years
Sensitivity	Very Good	Very Good	Very Good
Selectivity	Excellent	Very Good	Poor
Response time	seconds	seconds	seconds
Size	Medium	Medium	Small
Ease of use	Good	Excellent	Excellent

### Typical sensor signal during a test drive



- **Informal documents (VIAQ-10-04-rev1)**

- **Terms of Reference for the second stage (Draft)**

- ✓ **Objective**

- This proposal expands on the issues of the vehicle interior air quality, addressing exhaust gases entering into vehicle cabin air, to **develop a test procedure in a recommendation.**

- ✓ **End of mandate** : November 2020

- ✓ **New leadership team** : Chair(Russia), Vice-chair(Korea),Secretary(OICA)

- ✓ **Submit Final Terms of Reference** : 76<sup>th</sup> GRPE January Session

- **Next VIAQ IWG Meeting**

- **11<sup>th</sup> VIAQ IWG Meeting (TBD)**

- Geneva, Switzerland, January, during 76<sup>th</sup> GRPE session
- Half a day requested

- **12<sup>th</sup> VIAQ IWG Meeting (TBD)**

- March or April 2017