

# A Correlation Analysis of between PEMS and SEMS According to develop SEMS device

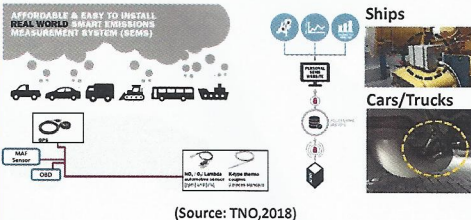
Jun Woo Jeong<sup>1)</sup>, Mun Soo Chon<sup>1)</sup>, Su Han Park<sup>2)</sup>, Junepyo Cha<sup>1)\*</sup>

<sup>1)</sup>Department of Automotive Engineering, Korea National University of Transportation, Republic of Korea

<sup>2)</sup>School of Mechanical Engineering, Chonnam National University, 77 Yongbong-ro, Buk-gu, Gwangju, 61186, Republic of Korea

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## Introduction



- Currently, RDE have been many restrictions on obtaining long-term driving and exhaust emission data in real road conditions that use PEMS.
- So, a SEMS (Sensor-based Emission Measurement System) was developed so it could efficiently acquire long-term driving and emission data by using the NOx sensor for an OBD system.
- HORIBA and TNO have agreed to start a collaboration on the industrialization of SEMS in 2018.
- Also, TNO showed that the SEMS was useful by monitoring real-world vehicle emissions for longer periods of time.

## Test methods

- Both PEMS and SEMS were installed in two vehicles that adhere to Euro 6, Euro 6d-Temp emission regulations to generate massive data under normal operating conditions in an actual road.
- The SEMS-1 was measured in 1 sec, the SEMS-2 was measured in 0.1 sec.
- In this study, It was analyzed correlation of between NOx emissions measured with SEMS in SCR outlet and measured with PEMS.
- The route is designed to be operated on cold-start conditions in RDE package 3 and it is consist of urban, rural and highway.
- Also, the tests were carried out under both cold start condition and hot start condition.

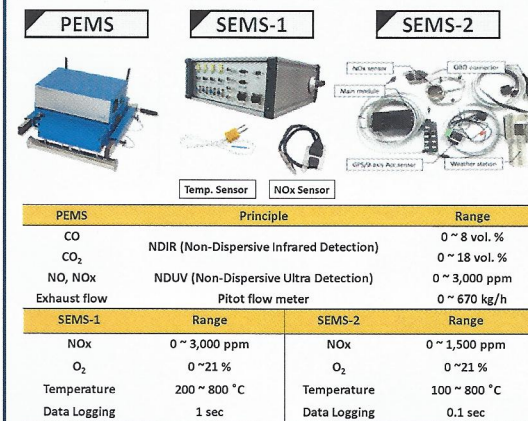
## Test Result

- The engine start condition was judged to have little effect on the correlation.
- The SEMS was influenced by NOx emission measured from Sensor.
- Nonetheless, since the SEMS-2 measured in 0.1 sec, it showed that the correlation was measured as mean 95%.

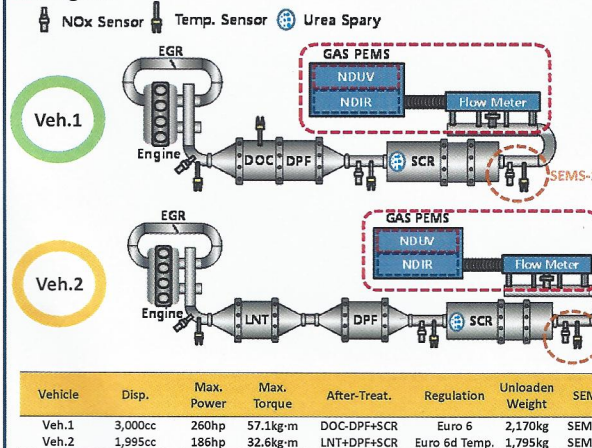
✉ Corresponding author : Junepyo Cha, Ph.D  
E-mail : [chaj@ut.ac.kr](mailto:chaj@ut.ac.kr)  
Associate Professor,  
Department of Automotive engineering  
@Korea National University of Transportation(KNUT)

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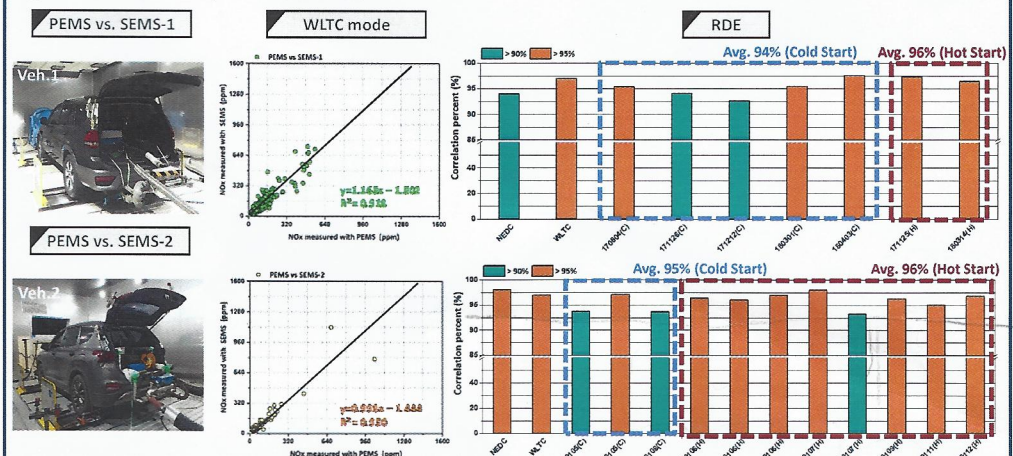
## Test Equipment (PEMS, SEMS)



## Diagram



## PEMS vs. SEMS-1, PEMS vs. SEMS-2



## Correlation Error Factor

