

Research and study for planning future measures for roadside atmospheric environment

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(Keywords) Roadside atmospheric environment, NO₂, SPM, PM_{2.5}

1. Introduction

In recent years, roadside atmospheric environment is improving significantly by tightened automobile exhaust emission control based on the Air Pollution Control Act and the Road Trucking Vehicle Act, restriction on use of diesel cars and introduction of post-setup PM reduction device at once in metropolitan area based on the Automobile NOx/PM Act, and improvement of traffic flow and trial introduction of purifying air technique by the road administrator, and so on. On the other hand, some roadside automobile exhaust monitoring stations mainly in traffic-intensive intersections are not satisfying the environmental standard for NO₂ concentrations in the atmosphere as of the year 2010.

NILIM is now conducting a research and study for correctly understanding the current situation of roadside atmospheric environment and its future transition in order to abstract roadside atmospheric environmental measures to be implemented predominantly from now on.

2. Study for understanding the current situation of roadside atmospheric environment

NILIM is conducting a seasonal survey of NO₂, SPM, and PM_{2.5} at the edge and hinterland (about 200m from the edge) of roadsides and highways which daily traffic volume is tens of thousands cars. See Figure 1 for an example of survey results. The figure shows while the NO₂ concentration at the edge of the roads is about twice as much as that at the hinterland, the concentrations of SPM and PM_{2.5} are shifting with almost at the same level both at the edge and the hinterland of the roads.

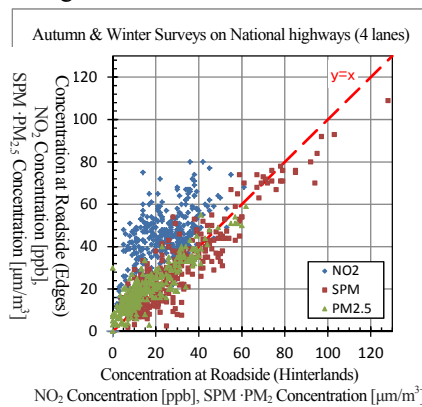


Figure 1. Results of roadside atmospheric study

3. Provisional calculation of future transitions in roadside atmospheric environment

Although the automobile exhaust emission control has been tightened so far, it will take more than ten years until the cars conforming to this regulation spread across the country because the regulation is applied only to new cars. For this reason, the environmental burden is expected to be reduced further by replacing the existing cars with new ones in the future. (See Figure 2.)

NILIM calculated future transitions in environmental burden in the surrounding areas of intersections based on effects of measures. One example of calculation results is shown in Figure 3. This indicates that the environmental burden will reduce substantially by 2020 and its main factor is a spread of cars conforming to exhaust emission control across the country.

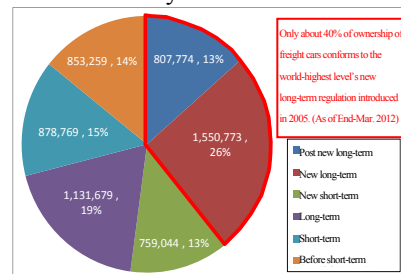


Figure 2. Share of freight cars conforming to exhaust emission regulations by years

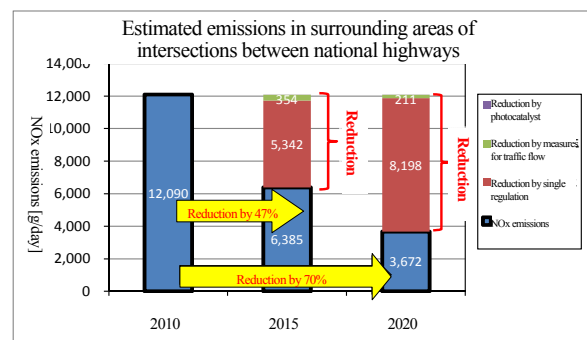


Figure 3. Estimation of NOx emissions in surrounding areas of intersections

4. Future direction

According to these study results, we think future measures for roadside atmospheric environment should specialize only in NOx physically, and be concentrated on spreading the cars conforming to more tightened exhaust emission regulation across the country promptly.