

Research Trends and Results

How Does Constructing a New Road Change Emissions of Carbon Dioxide from Automobiles?

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1. Introduction

In preparation for COP21 scheduled for November 2015, the government is now enacting a new greenhouse effect gas reduction plan for Japan as a successor to the Kyoto Protocol Target Achievement Plan. The Road Environment Division is conducting research and development of a method of monitoring carbon dioxide (below, "CO₂") emission from automobiles and a method of predicting changes in CO₂ emissions from automobiles accompany the opening of a newly constructed road.

2. Study method

In order to quantitatively clarify the CO₂ emission reduction effects of constructing a new road, Road Traffic Data (traffic volume, traveling speed) collected by private sector probe cars or traffic counters was used to calculate change of CO₂ caused by the completion of an individual road project.

3. Study results

The quantity of CO₂ emissions by regional block computed based on road traffic data conformed generally with CO₂ emissions computed based on inventory data (greenhouse effect gas emission data caused by fuel consumption). (See Figure 1)

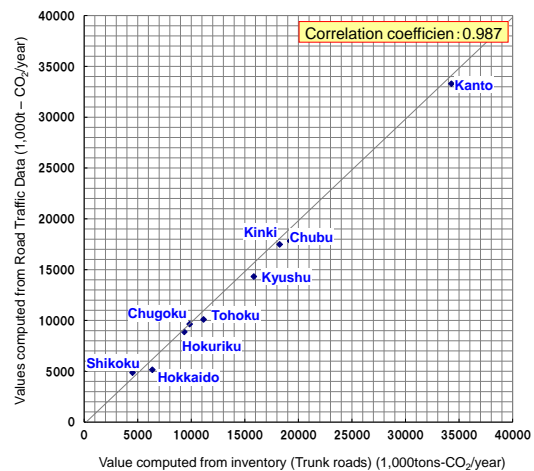
And road traffic data for the same month of the year before and year after opening of the road was used to calculate and compare change of CO₂ emissions by the opening of a new road. (See Figure 2)

The results clarified the average traveling speed improvement effects of constructing the new road at the same time as they confirmed that improvement of average traveling speed did not increase CO₂ emissions, even in sections where the traffic volume increased.

4. Future Plans

Based on the results and knowledge obtained by this

Figure 1 Results of Comparison of Calculated CO₂ Emissions



study, we will perform further verifications to build a method of monitoring CO₂ emissions by automobiles and a method of predicting changes in CO₂ emissions from automobiles resulting from the construction of a new road.

[Sources]

1) TECHNICAL NOTE of NILIM No. 671

<http://www.nilim.go.jp/lab/bcg/siryou/tnn/tnn0671.htm>

Figure 2 Changes of Average Traveling Speed, Traffic Volume, and CO₂ Emissions by the Construction of a New Road Obtained Using Road Traffic Data (National Highway 23, Toyohashi BP)

