

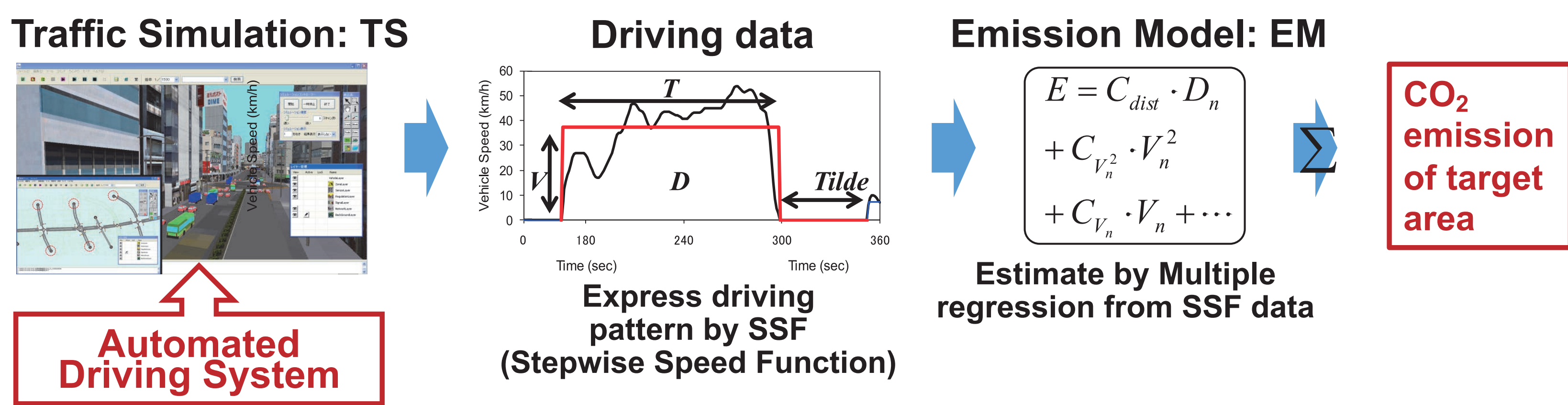
# Development of a tool for assessing the impact of automated driving systems on traffic flow and CO<sub>2</sub> emissions



## Objective

- The effect of CO<sub>2</sub> emission reduction by improvement of traffic flow and reduction of traffic accident by the introduction of Automated Driving System will be quantified by an impact assessment tool under development.
- The impact assessment tool has been developed in accordance with the international joint report “Guidelines for assessing the effects of ITS on CO<sub>2</sub> emissions” published under international cooperation between Japan, Europe and the U.S. in 2013.

### <Outline of the evaluation tool>



### <Target systems for the evaluation>

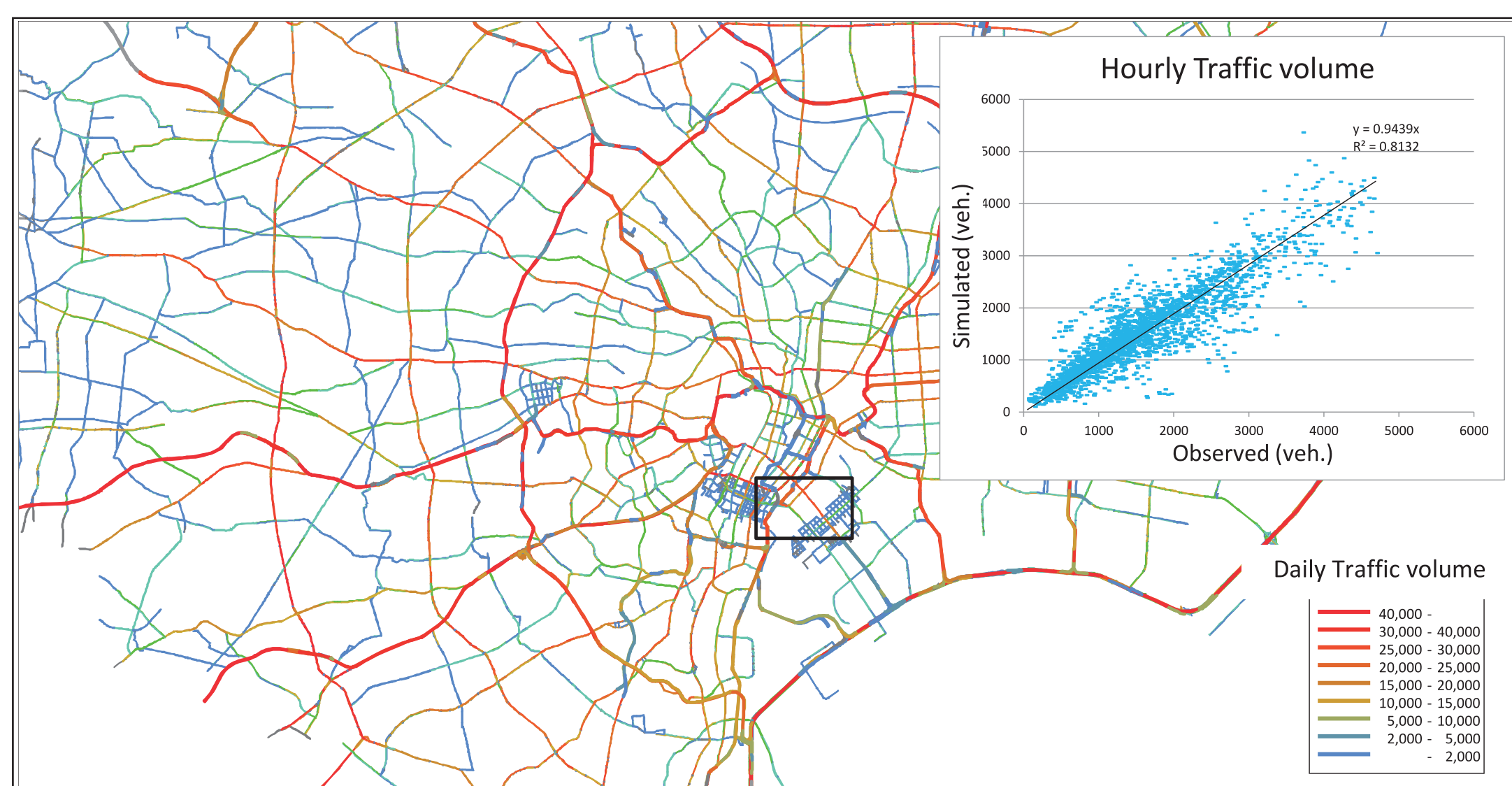
- ✓ Truck platooning on expressways
- ✓ Automated driving on expressways
- ✓ Advance Rapid Transit (ART)
- ✓ Automated driving on general roads
- ✓ Automated driving for last mile
- ✓ Automated valet parking
- ✓ Green wave driving utilizing traffic signal information

## Project Outline

### 1. Traffic simulation

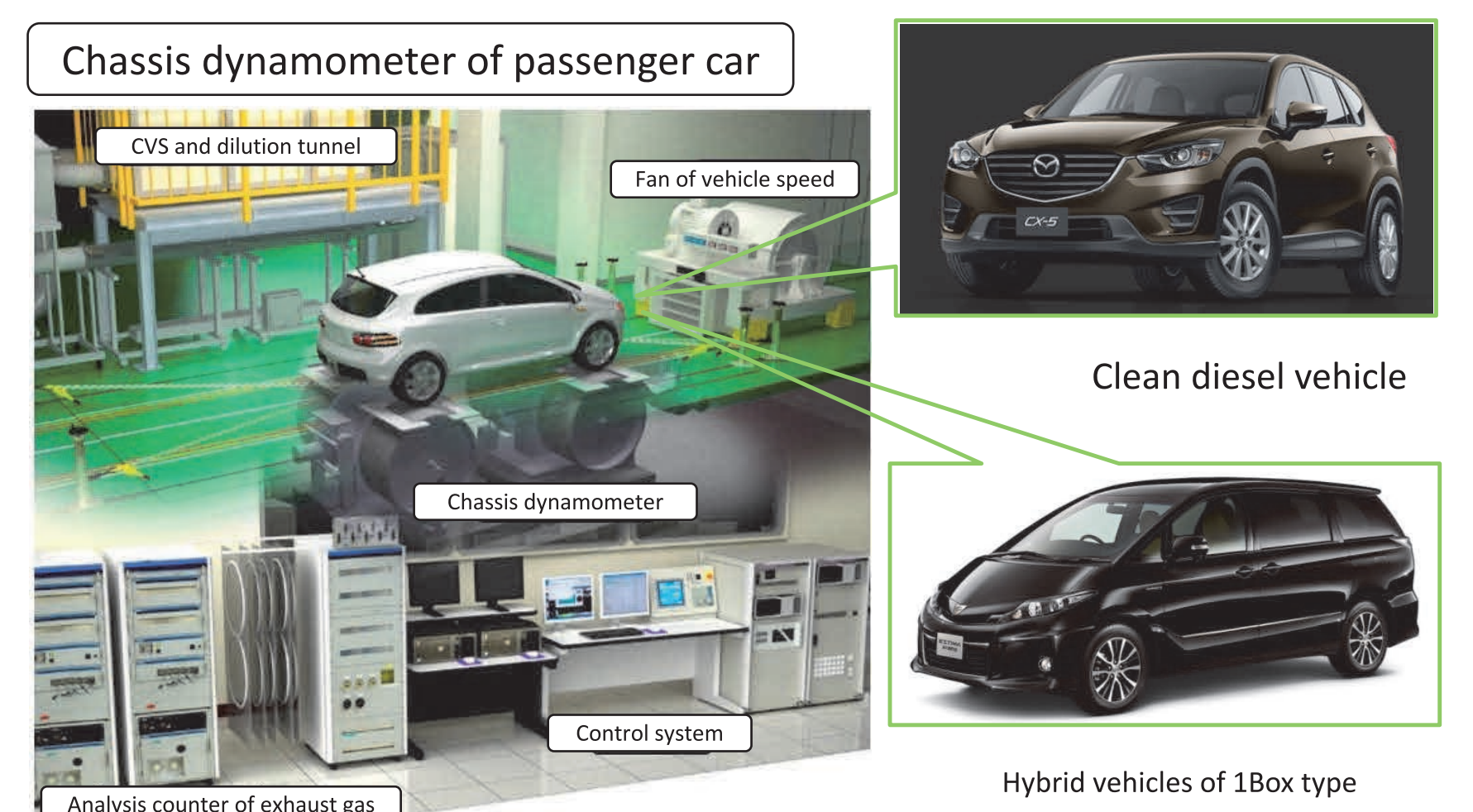
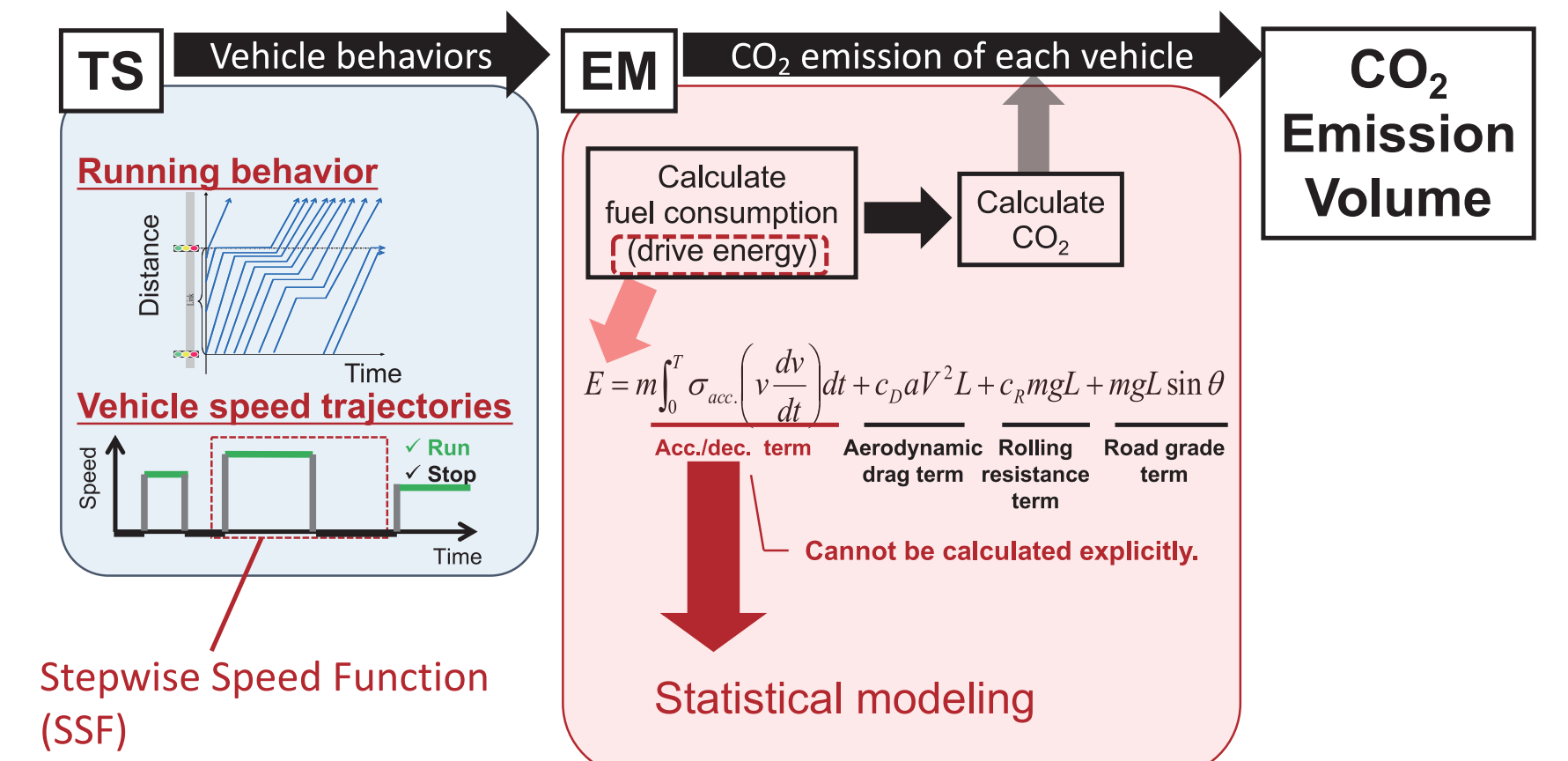
Functions for reproducing the behavior of a vehicle with Automated Driving System have been developed and installed in the traffic simulation model.

#### <Validation with traffic volume in Tokyo metropolitan network>



### 2. CO<sub>2</sub> emission model

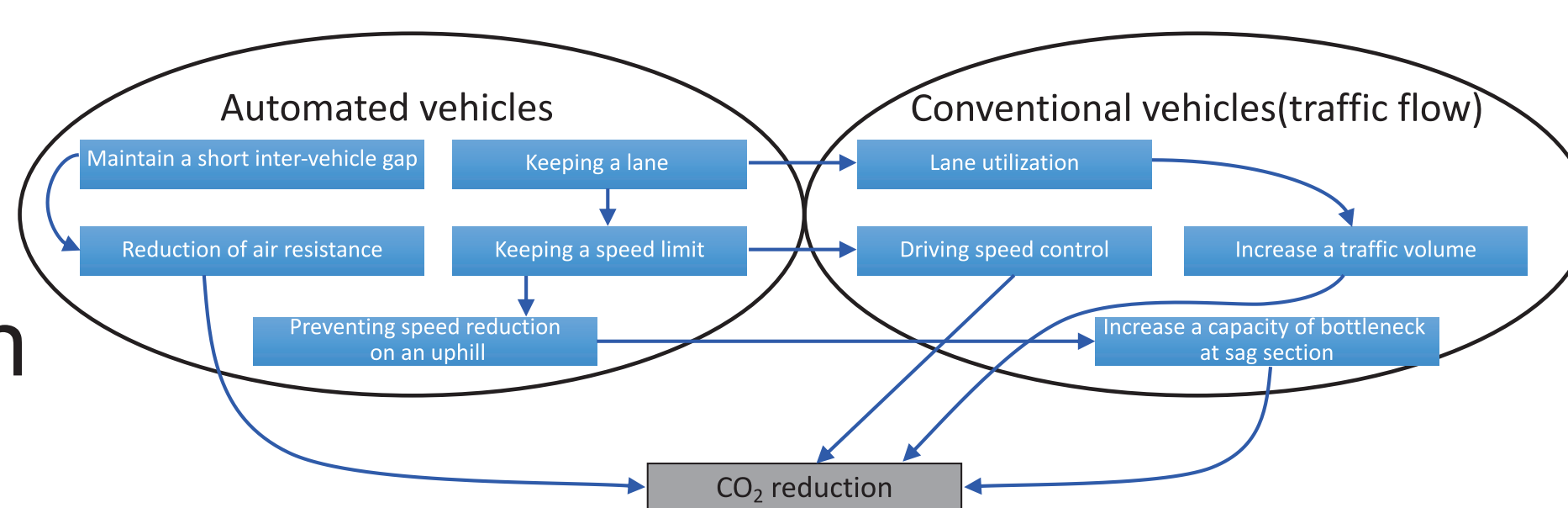
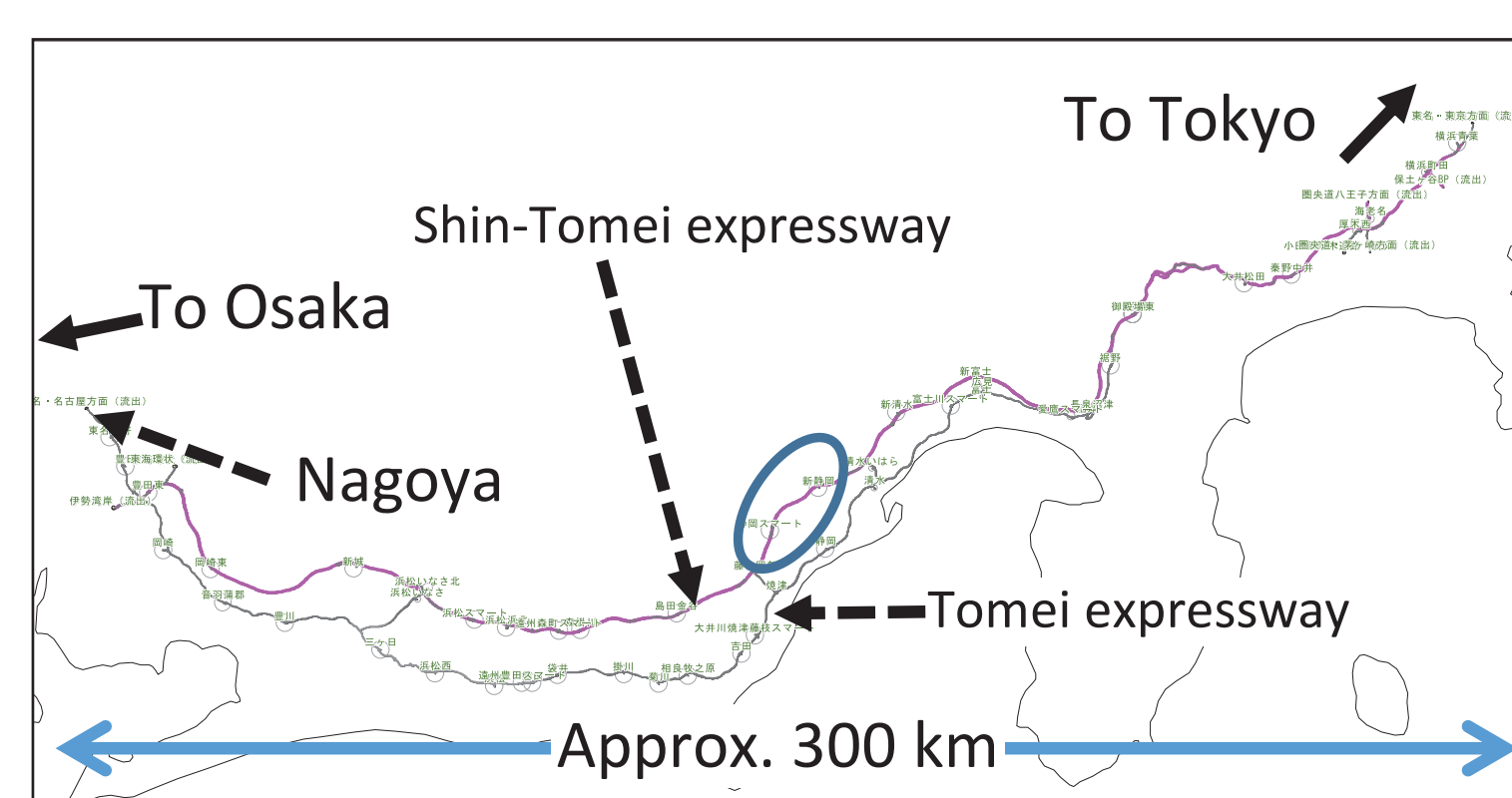
The CO<sub>2</sub> emission model which is formulated with a regression formula by results of field tests and chassis dynamometer tests has been updated.



### 3. Example of a tentative result (Truck platooning)

#### <Hypothesis scenario for the evaluation>

- 4 Platooning trucks form a convoy with 4 meter spacing
- 3,000 platooning trucks run on Shin-Tomei Expressway in 24 hours between Tokyo and Nagoya (it accounts for 1.7% of the whole trip of heavy-duty truck)
- 1,000 out of 3,000 platooning trucks run in the midnight



#### <CO<sub>2</sub> emission variation with/without truck platooning (all vehicles)>

