

Aerodynamic Visualization and Simulation of Red Taxi

The modified pickup truck taxi, also known as red taxi, is the only main public transportation in Chiang Mai, Thailand. The smell from the taxi's exhaust experienced while riding in the back of the taxi is uniquely unpleasant. This work, how the air flows over the taxi and how the exhausted particles flow into the back of the taxi were determined with both visualization and computer simulation. The 1:5000 3D red taxi model was constructed using 3D printer. The model was used for various airspeed flow visualization via schlieren photography technique in a customized small wind tunnel. The turbulent wakes formed behind the taxi were found to have caused the exhausted particles to flow to passengers. The computational fluid dynamics simulation was also conducted to compare with the visualization. The simulation results agreed well with the visualization from schlieren photography technique. From both studies, it is suggested that, in order to reduce turbulent wakes, the two side-windows have to be closed while keeping the front overhead-window open.

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