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Supplementary Materials for

Airflows inside passenger cars and implications for airborne disease transmission

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This PDF file includes:

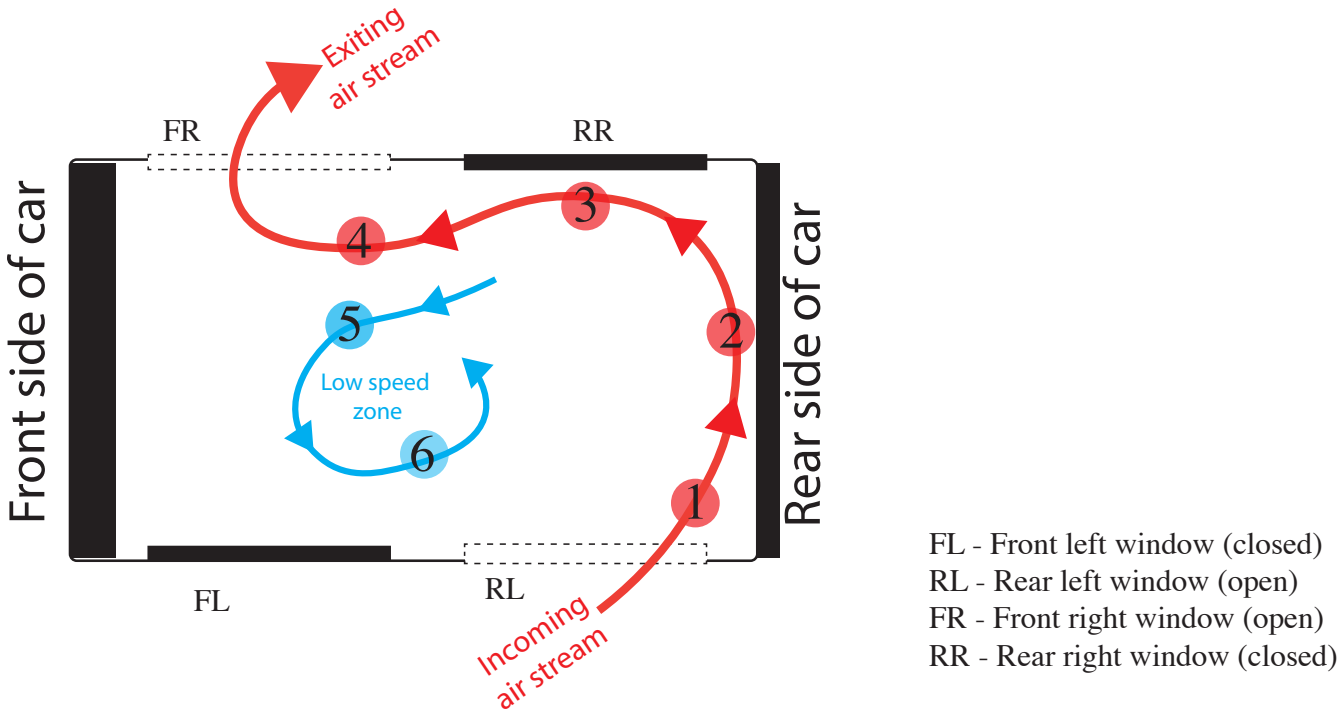

FIG. S-1. **Schematic of the approximate flow direction inside the car cabin.** The orange streamline illustrates the high speed incoming flow from the rear window, which moves along the back of the car cabin before turning around at the rear left corner and exiting the front window. The blue streamline gives an approximate depiction of the low speed circulation zone in the middle of the cabin. The smoke generator and flow wand techniques in the next figure, substantiate these flow pattern.

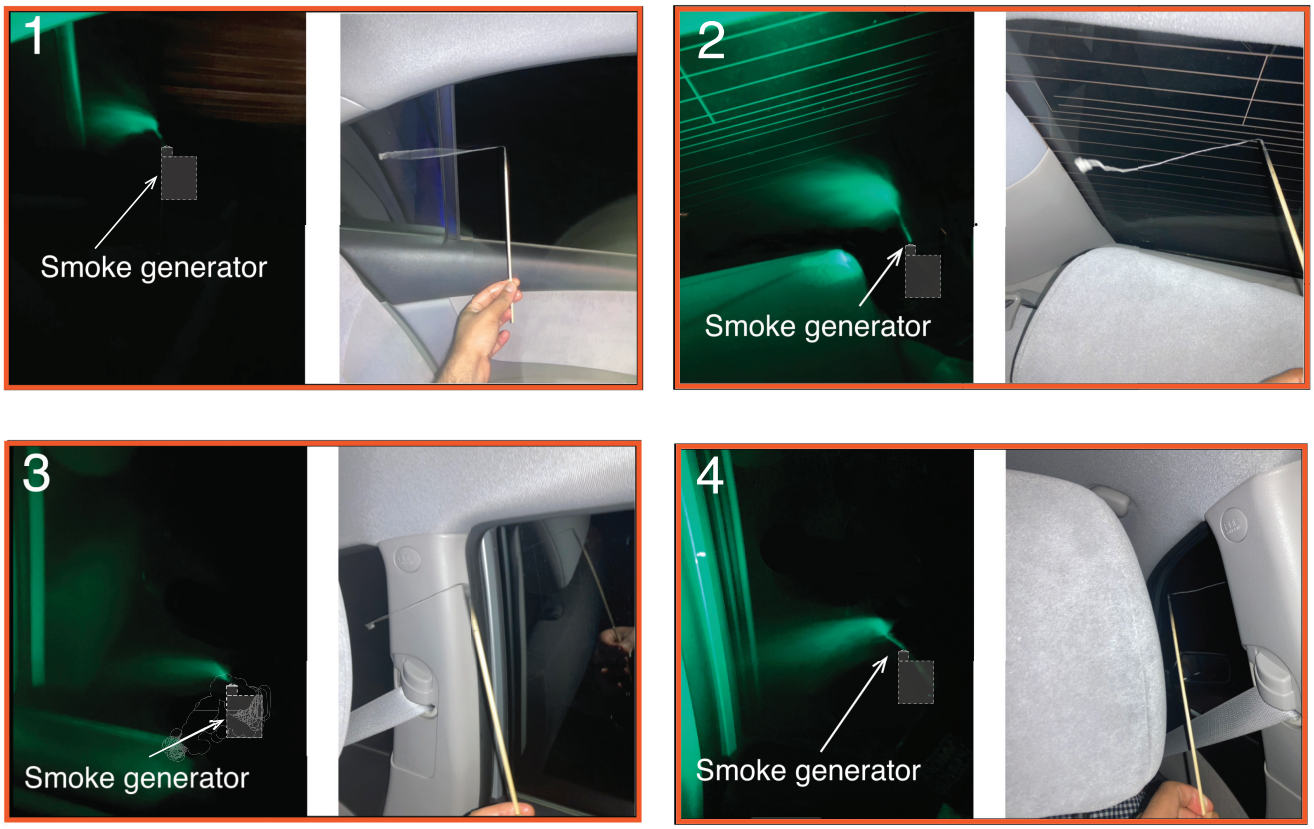

FIG. S-2. **Field test images obtained using smoke generator (left sub-figure) and flow wand (right sub-figure).** The sub-figures (1)-(4) correspond to the region traced by the high speed air stream given in orange in Fig. S-1. The smoke and flow wand directions are to the left side in the images (1)-(4), which was combined to draw the approximate streamline pattern (orange color) shown in Fig. S-1. The smoke jet is rapidly pushed in the direction of the flow, which provides a qualitative picture of the high air speed along this streamline path. The field test also confirms the conclusions of the steady RANS simulation discussed in the main paper. [photo credit: Varghese Mathai]

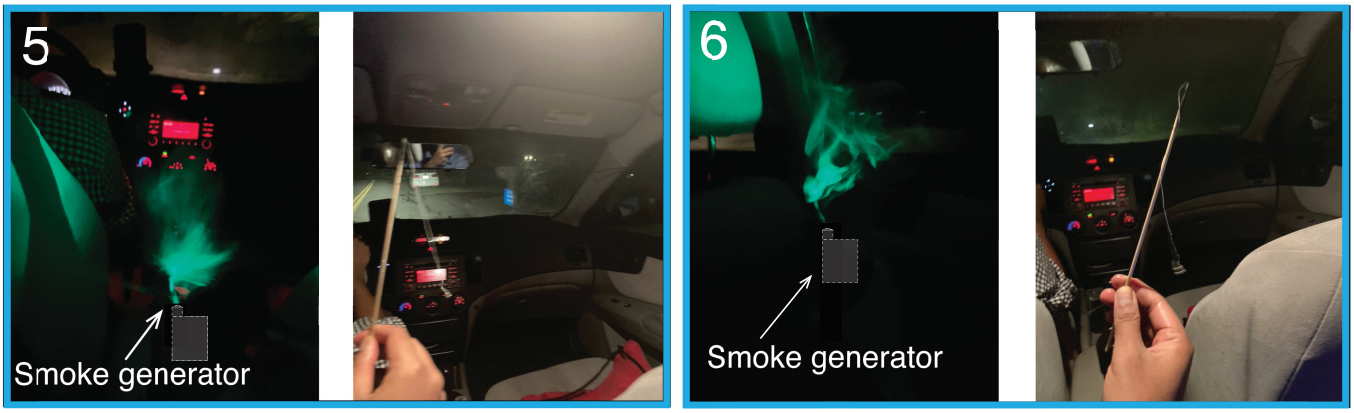

FIG. S-3. **Field test images obtained using smoke generator (left sub-figure) and flow wand (right sub-figure).** The images in sub-figures (5) and (6) were taken near the circulation zone, given in blue in Fig. S-1. The smoke diffuses very gently in this zone, indicating a low air flow speed. Similarly, the flow wand fails to catch the wind, and stays almost vertical, suggest a stagnant region of air. This field test provides a validation of the results from the steady RANS simulations. [photo credit: Varghese Mathai]

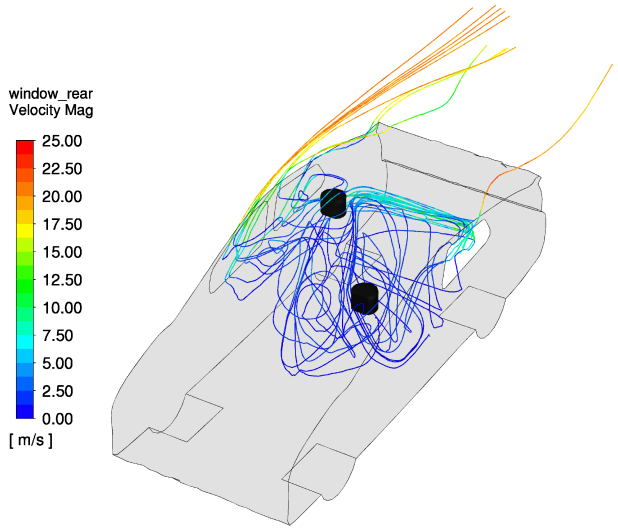

FIG. S-4. **Streamlines colored by velocity magnitude for Config. 4 with three windows (FL, RL and RR) open.** The opening of the third RR window adjacent to the passenger causes a portion of the incoming air stream to be bled out.

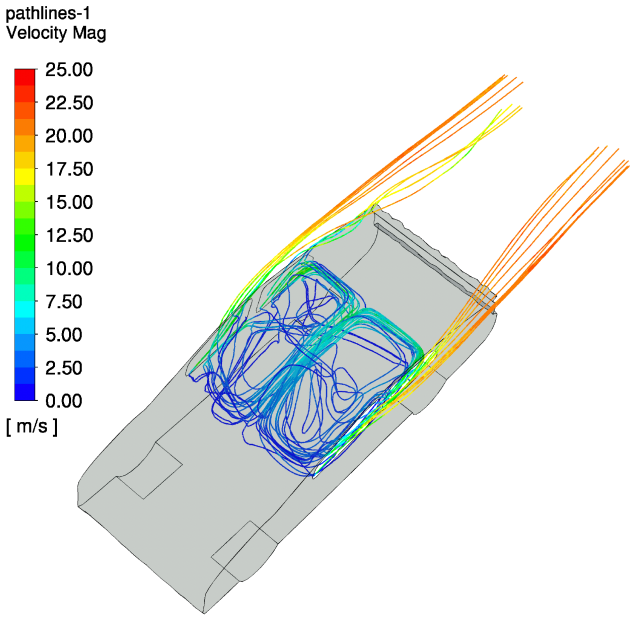

FIG. S-5. **Streamlines colored by velocity magnitude for Config. 6 with all four windows open.** The flow gets compartmentalized into a left and right zone. In each of these zones the streamlines are directed from the rear window (with higher pressure) toward the front window (with lower pressure).

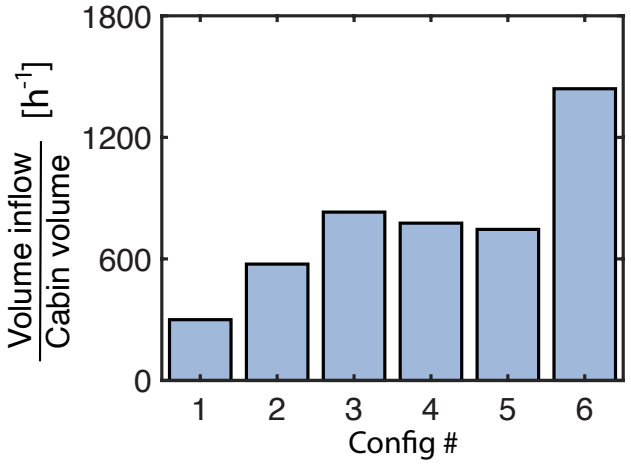

FIG. S-6. **Volume of air entering the windows per unit time, compared to the overall cabin volume.** The all-windows-open case draws in a significantly more amount of air, whereas the other cases do not exhibit much difference.

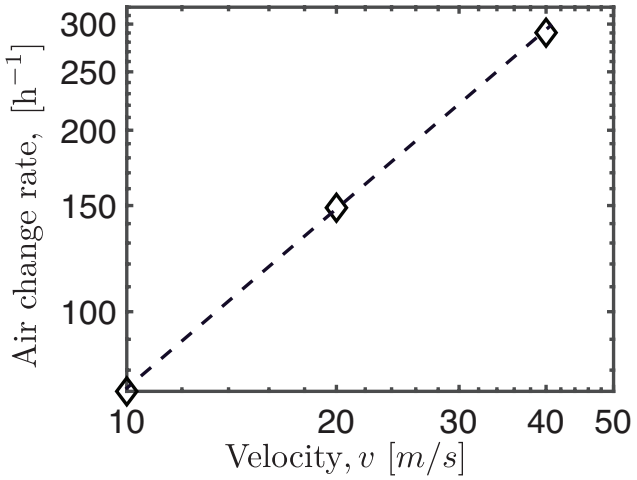

FIG. S-7. **Air changes per hour (ACH) vs. speed of the car, *v*, plotted on a log-log scale.** The ACH scales linearly with the mean flow speed, as indicated by slope 1.